HOW TO FLY A LIGHT TWIN

FLYING

THE WORLD'S MOST WIDELY READ AVIATION MAGAZINE

AUGUST, 1957
35 CENTS

A BOOK CONDENSATION:

Memories of a Pioneer

Gen. Frank Lahm, distinguished American airman

Personal Paradise for Pilots

Blakely Island, the land of enchantment

★

CHECK PILOT REPORT

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AUGUST, 1957 VOLUME 61, NUMBER 2

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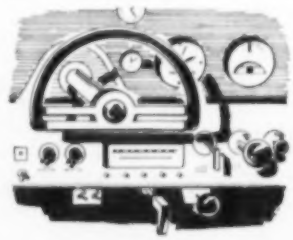
by STANDARD OIL COMPANY OF CALIFORNIA

Planting trout by air into Cascade lakes

"Bombing" mountain lakes with fingerling trout, Sam Whitney has revolutionized Oregon's fish-stocking program. In just one month he "plants" more than 350 lakes by flying 150 feet above the water — high enough for the fish to lose their forward motion before they hit. Pack trains previously spent all summer stocking only 60 lakes.

"Dropping toward those small lakes in timber country can be a lot of fun," says Mr. Whitney, "as long as I know I have enough power to get up and out again. That's why I use Chevron Aviation Gasoline — it *always* gives me the extra power I need, without a miss. It never fouls my plugs, either. There's no better gas made.

"I know RPM Aviation Oil is the best 'engine insurance' I can get. It keeps my planes running smooth and free for hundreds of extra hours, with never a stuck valve or ring. In fact, when a customer comes to my base at Newberg, Oregon, with that trouble, I usually cure it just by flushing out his engine with 'RPM'."



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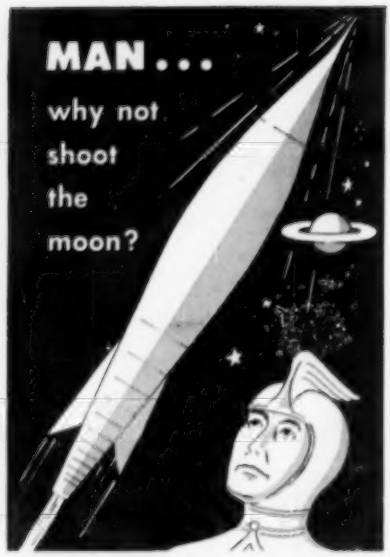

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MAILBOX

CHECK PILOT REPORT

I am a Cessna owner but in my opinion Cessna and Norman Jacobshagen (Check Pilot Report on the Cessna 182, March FLYING) have missed the safety boat in extolling the virtues of the internal drain valve lever on the new 182.

While a pilot is usually only draining a small amount of water and sediment during his preflight check, there is the 1 to 10,000 chance of a two or three gallon water problem. Part of the preflight should be to examine what is drained.

From a personal experience ("I learned about flying from that") I know that water can be purchased along with gas from reputable operators.

Of course, I realize that it is better to drain a cupful of gas than none, so perhaps the new valve will get more pilots to do a partial job. Let's hope that it doesn't discourage the "lookers" from crawling under and "looking."

WALTER J. SIMONS

Birmingham, Mich.

● *Cessna reports that 1,181 Model 190's and 195's were manufactured with the internal fuel drain and their service department says no difficulty was experienced nor were any complaints received from the 1957 Model 182 to date.*—ED.

CONFUSED

Although I must confess to being a Greenhorn in the flying game, I am a bit puzzled as to the implication derived from reading "Want a Used Lightplane?" and "Check Pilot Report on the Stits Homebuilt" in March FLYING.

With all due respect to Mr. Stits and his concern, I fail to see why an individual would put $2,400 plus much time and effort into the construction of a home-built craft such as the Flut-R-Bug with its 200-mile range, relatively low 100 mph cruise and cramped quarters when, as stated in the used lightplane article, you can purchase a good, similarly equipped Cessna 140, Ercoupe or Luscombe for the same or less money.

I am very much interested in building my own lightplane but when I do I will want to gain something for my sweat—either in lower price than an equivalent used ship, or in higher performance.

H. A. OLSON

Fairbanks, Tex.

50 YEARS OF AIR POWER

Your impressive article "50 Years of Air Power" (February issue) landed a blow that made a few oldtimers grab the ropes. Quite a few years ago I spent many sleepless nights mothering an old Douglas B-23, alias UC-67 No. 9035 in and out of inspections and engine changes throughout the U. S. While it was born too late to collect any of the honors due the B-18 and B-19 and was too old to follow the A-20 into combat, it does never-the-less deserve honorable mention. Remember this also, in measuring airpower many battles are fought and won before the fight has begun.

M/SGT. W. D. MATHEWS

APO 323, San Francisco

● *Only 38 of the B-23's were manufactured by Douglas and 12 were converted to UC-67, a number of which are still flying as executive aircraft; one by National Distillers, two by General Electric and one for personal transportation by Juan Trippe, Pan American's prexy.*

LUCKY LADY

In answer to Mrs. Cal Hampton of Galion, Ohio in the May "Mailbox" (re: refueling), both Mr. and Mrs. Hampton are correct. The current and best known type of refueling in flight is with the tanker ahead and above the receiver. This method was used when the B-52's recently flew around the world non-stop. The way Mrs. Hampton describes was used between the B-50A models and the hose type KB-29 tanker. This method was used when Lucky Lady II went

around the world March 1949. Lucky Lady II was from the 43rd Bomb Wing of which I was a member.

JOE GORDON

Havertown, Pa.

● *Other champions of Mrs. Hampton's cause were Kenneth Whiton, Peterborough, N. H.; Michael Firth, Crystal Lake, Ill.; Act. T/Sgt. Jan Worley, Youngstown, Ohio. CAP Squadron and T/Sgt. J. S. Hendon, 71st Air Refueling Sq., Dow AFB, Maine.*—ED.

HOSPITALITY AT MT. HAWLEY

Recently while on a cross-country from Wichita, Kan. to Syracuse, N. Y., in a new Cessna 172, without radio or other than basic instruments, I became weathered in for four days at the Mt. Hawley Airport, Peoria, Ill. I would like to take this opportunity to thank the management for their splendid service and

(Continued on page 84)

THE BIG STICK

Since 1946, Martin engineering has placed special emphasis on the science of rocket and missile development.

It is because of this that Martin is now building a most potent and important weapon system—the ICBM Titan—an ocean-spanning missile to back up the traditional American policy of peace with honor: *"Speak softly and carry a big stick!"*

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HAVE YOU READ?

By JAMES F. SUNDERMAN

NIGHT FIGHTER: by C. F. Rawnsley and Robert Wright (Henry Holt, $4.50). Two former RAF officers collaborate to spin a personal account of the development and role of British night fighters from the late 1930's to the end of WWII. Rawnsley flew the war as radar-gunner for Britain's renowned night fighter ace, John Cunningham; Wright saw night patrol over England, North Africa, and the Middle East. Their combined experience brings together an authentic study of a little publicized facet of air war. Told by Rawnsley in the first person it is mainly concerned with the combat experiences of himself and Cunningham, who is credited with pioneering this new form of air combat.

In the early days, little could be done against the nightly invasion of Hitler's air fleets. Introduction of the radar-equipped Bristol Beaufighters and DeHaviland Mosquitos gave the RAF a shot in the arm. Even so, night fighting was a new element for the RAF. The price paid in men and equipment to drive the Germans out of British night skies was high. But the price of gutted English cities was higher. Rawnsley tells how the RAF night fighters shared in winning control of the air over England, followed by operations with Bomber Command's night offensive over the Continent. Detail and technicalities on air combat and ground organization makes this one *more* for the professional airman than for the layman. It is an excellent study of a specialty that has evolved into a highly refined military profession.

THE ZEPPELIN IN THE ATOMIC AGE, by Edwin J. Kirschner (University of Illinois Press, $3.50). Plumping for a return of the dirigible powered by atomic engines, Kirschner presents a solid study of the zeppelin from its beginning through its demise just prior to WWII.

Believing atomic power heralds an age of atomic airships, he explains how atomic zeppelins could serve multiple uses as air carriers, especially as vehicles for "Open Skies" operation proposed by President Eisenhower. Chapters on engineering characteristics, economy of operation, and roles in military and civilian usage document his case for the atomic gas-bag as an intermediate carrier between the steamship and the cargo airplane.

THE PROVING FLIGHT: by David Beaty (William Morrow, $3.75). Writing with a descriptive feeling for flight, Beaty (former MATS pilot and BOAC skipper and currently full-time author) spins a novel of suspense over the Atlantic, as a new-type turbojet airliner on its first trans-atlantic non-stop test flight from London to New York, encounters weather and engine trouble.

GLACIER PILOT: by Beth Day (Henry Holt, $4.50).

Books by or about practical airmen make up, perhaps, the most important element of air literature. Some recent ones have been Lou Reicher's *The Flying Years;* Pan-Am Pilot Basil Rowe's *Under My Wings;* Bill Bridgeman's *The Lonely Sky;* AF Maj. Chuck Yeager's story *Across The High Frontier;* and *Wing Leader* by J. E. "Johnnie" Johnson.

Last month another was added to this list. *Glacier Pilot* is the biography of Bob Reeves, Alaskan bush pilot, airman-of-fortune and today owner of the Alaskan-Aleutian Airways.

In 1932 Reeves stepped ashore at Valdez, Alaska, broke and baggage-less, but determined to make his fortune in the wilderness. Young Reeves already had adventure and experience behind him—carrying airmail over the Andes Mountains in South America. Looked on at first as just another pilot, he lost no time proving his exceptional prowess. In exchange for food and lodging he contracted to fix up and fly out of the Valdez "air patch" a wrecked "Eaglerock." The "locals" bet this new statesider would splatter himself.

The announced day arrived and Valdez turned out. Without even the traditional helmet and goggles Reeves revved-up the J-5, scampered across the little mud field and lifted into the air. The way he handled his plane was enough to convince the citizenry. Reeves was "in"—one of that special breed which all Alaskans, from Eskimo to bartender, knew held the key to the future. His was to become one of the most fantastic careers in aviation history.

"Anywhere you'll ride, I'll fly," he once wired a customer wanting transport to the top of Walsh Glacier, 8,750 feet up the slope of Mount Lucania. "Anywhere

(Continued on page 17)

COMPARE & DISCOVER

COMPARE the Mark 20 with other four-place executive airplanes.

DISCOVER why the Mark 20 is years ahead in styling and performance.

	Mark 20	Plane Type 82	Plane Type 72	Plane Type 22
PERFORMANCE				
Cruising Speeds (70% h.p.)	165 mph	155 mph	124 mph	128 mph
Engine h.p.	150 hp	230 hp	145 hp	150 hp
Range	900 miles	655 miles	620 miles	525 miles
Pay Load	720 lbs.	679 lbs	673 lbs.	669 lbs.
Rate of Climb	900 ft./m	1030 ft./m	660 ft./m	725 ft./m
Service Ceiling	17,200 ft.	19,800 ft.	13,330 ft.	15,000 ft.
SAFETY				
Military proven low-wing visibility	Yes	No	No	No
Tubular steel safety cabin	Yes	No	No	Yes
All-weather adjustable engine cooling system	Yes	No	No	No
Non-fatigue spruce wing	Yes	No	No	No
ECONOMY				
Miles per gallon	20	12.7	15	14.7
Cost per engine hour of operation (Based on engine exchange prices)	$1.00	$3.45	$1.50	$ .93
Fuel cost per mile	2c	2.8c	2.4c	2.6c
Total cost per mile (Based on 600 hours operation per year)	6.6c	9.8c	8.2c	8.3c

•The Mark 20 is the first "really new" executive plane in years. Its new aerodynamic design features of the jet age produce greater performance with less horsepower. Mooney wants comparisons. Mooney wants you to be the judge.

•The years-ahead Skystreak Styling of the Mark 20 brings to you a combination of economy, safety, and high performance. Features include laminar flow wing—the only flexible wing on an executive airplane—no-drag trim, full sky visibility, retractable tri-cycle landing gear, and low center of gravity for ease of handling on the ground and in strong cross winds.

•You're years and money ahead when you own a Mark 20. Make comparisons, get the facts. See your Mooney distributor.

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MOONEY AIRCRAFT, INC., Kerrville, Texas

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☐ Mark 20 sales franchise.
☐ Information on the Mark 20.

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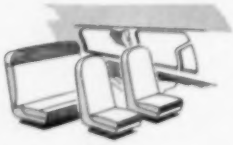

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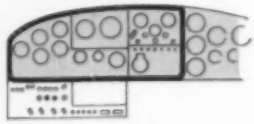

NEW
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panel grouping

Now...a whole year ahead...the fast Cessna 310B for

Here's twin-engine flying's greatest comfort achievement—a completely new and roomier kind of cabin. It's sound-sealed and fully insulated... soft and spacious, to wrap you in restfulness, the whole quiet 213-* mile-an-hour ride!

* See specifications

It's the most advanced twin in the sky, this fast and beautiful new Cessna 310B.

Far more than just a "warmed over" model, it's truly next year's airplane here today, with all the advanced performance and safety features that have made the 310 famous—unequalled power per pound of weight, wing-tip safety tanks, superb "engine-out" dependability. And now, you get all this plus a completely new kind of cabin comfort!

There's new quiet in the Cessna 310B, because its Comfort-Sealed cabin is completely insulated from floor to ceiling and all around; its windows and windshield double-heavy and vibration-free.

There's constant climate control with its brand-new heating and ventilating system that surrounds you with a soft flow of fresh, cooling air in summer—and in winter, blankets you in warmth from its "double-capacity" heater.

And there's real deep-cushioned comfort in its new and wider cabin—with extra room where you want it most! You can choose the fully adjustable all-in-one rear seat that tilts back for lounging at a touch, or optional

CESSNA 310B THE WORLD'S BEST ALL-AROUND LIGHT TWIN:

NEW
fully adjustable seats*
*separate reclining rear seats optional

NEW
giant 19-cu. ft.
baggage compartment

NEW
"double-capacity"
cooling & heating

NEW
fully retractable
double step

1958!—with the revolutionary "Comfort-Sealed" Cabin

separately reclining rear seats (comfort experts say they're the most perfect airplane seats yet). You also get such new and luxurious extras as rear-seat armrests, full-width magazine racks, and sparkling new fabric and color combinations. Front seats, too, are fully adjustable, softer and more relaxing than ever.

But all this is only the beginning! You'll see a new, more functional kind of instrument panel, grouped for easier I. F. R. flight, with new nonglare "post" lighting. A new, bigger baggage compartment. A new retractable double step to make getting in and out really easy. New, easy-opening cowling fasteners for quicker engine maintenance.

One look, one flight at your Cessna dealer's will prove it! This is the most advanced twin available today. He'll show you scores more new features, from an improved oxygen system to new and luxurious carpeting, a bigger luggage shelf, a better taxi light—even new giant-size ash trays!

The Cessna 310B is priced (with std. equip.) at $59,950 f.a.f. Wichita. See your Cessna dealer or write CESSNA AIRCRAFT CO., DEPT. F-10, Wichita, Kan.

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Briefings . . .

NEWARK AIRPORT is to have this new 12-story, 150-foot high control tower—the fourth in its 29-year history—in 1959. It will replace the 65-foot tower provided by the Army Air Force during WW II. Major portion of the new tower, a feature of which is a circular radar dome 17 ft. in diameter, will be occupied by the CAA who will employ a total of 75 controllers and other specialists on a 24-hour basis.

CESSNA AIRCRAFT and the Hertz (car rental) Corp. are inaugurating the nation's first Rent-A-Plane Service, whereby qualified pilots and charter customers will be able to rent the Cessna 172, 182 or twin-engined 310 from any one of 50 selected Cessna dealers or through any Hertz car rental office. Cost for a 172 rental is quoted at $1 per hour, plus 15 cents per air mile.

IN THE DALLAS (TEX.) AREA, Addison Airport is rapidly taking shape as a complete executive aircraft base. Representing an outlay of $2.3 million, the new facility when completed will operate on a 24-hour basis. Under construction are two 5,000-ft. hard-surfaced runways, a 5,000 sq. ft. terminal building which will include a restaurant, a large hangar and repair facilities.

FOR OUTSTANDING CONTRIBUTION to aviation progress, General E. W. Rawlings, Commander of Air Materiel Command was selected by Aviators' Post 743 (New York) as 1957 recipient of the Mitchell Award, a memorial to General

William E. Mitchell. Last year's recipient, Gen. Nathan F. Twining (right) made the presentation on behalf of the Post at an honors night dinner held in New York City.

THE BABB COMPANY with overhaul and maintenance facilities at Phoenix, Ariz., Linden, N.J. and St. Johns, Quebec, has merged with the Transocean Corp. of California. Transocean with headquarters in Oakland, is the parent of some ten companies engaged in a wide range of aircraft maintenance operations virtually around the world. Babb was a wholly-owned subsidiary of the Atlas Corp.

CONTINENTAL AIR LINES and Pacific Airmotive have entered into what is said to be the first commercial jet engine overhaul agreement. PAC, the only private maintenance facility now fully equipped to overhaul Pratt & Whitney J-57 jets, is to service Continental's fleet of Boeing 707, J-57-powered Golden Arrow airliners, upon delivery in 1959.

RECENT PERSONAL APPEARANCE of Robert Young, movie and TV star, in Bethany, Okla. had nothing to do with either profession. The star came to Bethany to take personal delivery of a new Aero Commander 680 Super, purchased through his local distributor Santa Mon-

ica (Cal.) Aviation, Inc. Board Chairman, George T. Pew (left) with Mr. Young, is certain "Father Knows Best." Through Vest Aircraft de Mexico, S. A., another 680 Super went to "Cantiflas," star of "Around the World in 80 Days. His personal pilot, Gilberto Vallecillo, came to take delivery.

IN A NEW ATTRACTIVE JACKET, the 1957 Spring Edition of Standard Oil of California's (Western Division) Airport Dealer Directory is being distributed without cost to pilots in that area. Copies are also available to eastern and middle west aircraft owners who contemplate flying to the Pacific Coast this year. Address: 225 Bush Street, San Francisco 20, Calif.

SPARE PARTS for Taylorcraft (fabric-covered models only), may soon be produced by Universal Aircraft Industries (Univair) of Denver. Negotiations under way would embrace models BC12D, D and 19, which have been superseded by the Taylorcraft fiberglas 4-place models. Univair, located at Sky Ranch Airport, has acquired other manufacturing rights, including the aeromatic propellers.

OFFICERS AND DIRECTORS of the Aeronautical Training Society met for 15th annual election of officers in Washington, D. C. Re-elected president was S. J. Solomon (center) head of California Eastern Aviation, Inc., Washington, D. C.

Others (l to r) are Beverly E. (Bevo) Howard, Hawthorne School of Aeronautics, Moultrie, Ga.; E. Merritt Anderson of Anderson Air Activities, Malden, Mo; Mr. Solomon; Walter C. Gunstream of Texas Aviation Industries, Inc., Hondo, Tex. ATS v.p.; and H. S. (Bud) Baer, Jr., secretary-treasurer.

MINNEAPOLIS-BORN, 23-year-old JoAnn Annette Borseth, was acclaimed winner of the "Miss Spirit of St. Louis Award of 1957," as the world's ideal airline stewardess. A stewardess for North Central Airlines, Miss Borseth was selected from among 39 finalists chosen from some 1,200 stewardess nominees representing the world's major airlines.

PRIVATE AND BUSINESS PILOTS at Portland (Ore.) International Airport are now able to "make" their own weather through a free do-it-yourself "weather" bureau" and flight planning service set up by Flightcraft, fixed-base operators

specializing in business and corporate flying. A teletype and drop line from the U.S. Weather Bureau supplies weather sequences, flight advisories and 12 and 24-hour area and terminal forecasts. Telephone service to CAA tower and INSACS is also available.

TWELVE NEW east-west transcontinental airways, designed to handle non-stop flights between New York and other major eastern airports to major airports in the west, have been announced by CAA. Two of the routes, Victor 1510 between

(Continued on page 98)

FLY WEATHER-WISE — Mobil

These weather items prepared in consultation with the United States Weather Bureau

TEMPERATURE VARIATIONS

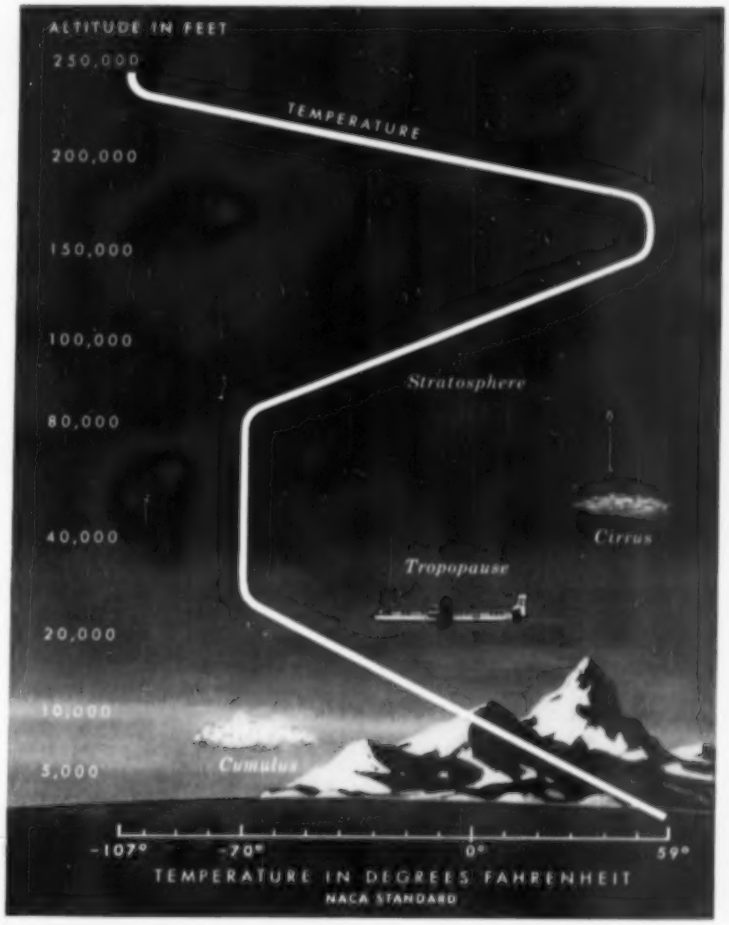
IN RELATION TO ALTITUDE...

TEMPERATURES encountered in a single flight may vary as much as 130°F. or more. These variations are associated with altitude and weather patterns and can affect flight performance.

Temperature and altitude—Heat from the earth warms the atmosphere with steadily decreasing effect as altitude increases. Temperature normally decreases with altitude at the rate of 3½°F. per 1000 ft. At the tropopause (top of troposphere) temperature remains almost constant up to 80,000 ft. Therefore, modern aircraft encounter coldest air in the tropopause layer which varies from about 28,000 ft. in the polar air masses to 54,000 ft. in the tropical.

As altitude increases from approximately 80,000 ft. to 150,000 ft., the temperature returns to almost sea level condition. This is the result of strong absorption of the sun's ultra-violet rays in the layer of ozone gas at very high altitudes.

At still higher altitudes, the temperature reverts to extreme cold.



FORECAST: *Top Flight Performance with Mobil Aero Hydraulic Oils and Mobilgrease Aero!*

Mobil

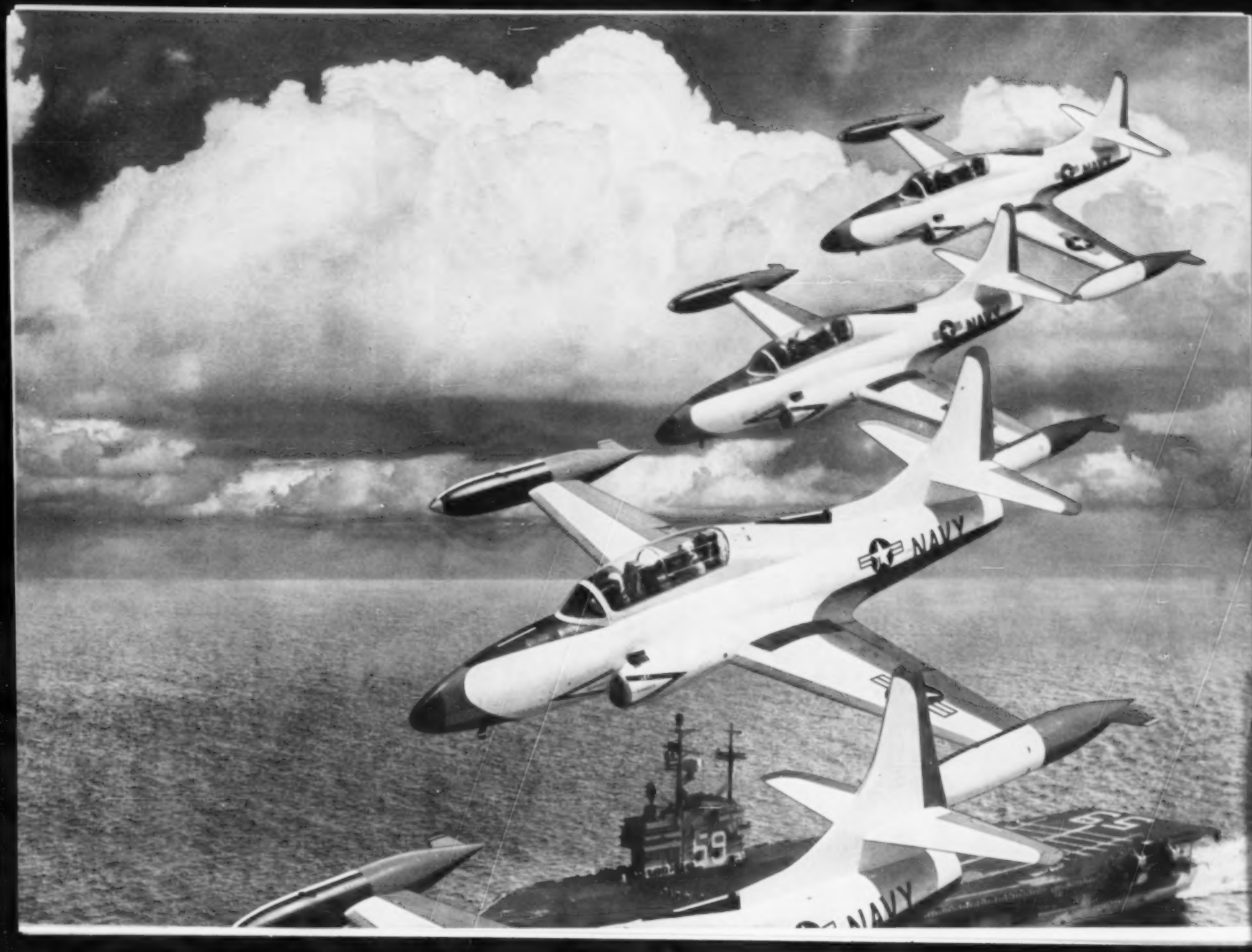
Leader in lubrication for 91 years

Instant control response can be yours despite extreme temperature variations, thanks to the wide range of temperature characteristics of these top-quality Mobil products.

Mobil Aero Hydraulic Oil HF and HFA—These low pour point and high VI oils help assure trouble-free operation of hydraulic control systems, brakes and struts through all temperature ranges.

Mobilgrease Aero Lo-Temp and General Purpose—These Aero greases help assure smooth operation of all sliding and rolling surfaces of aircraft parts . . . control systems, bearings, and gears.

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.


NAVY
59

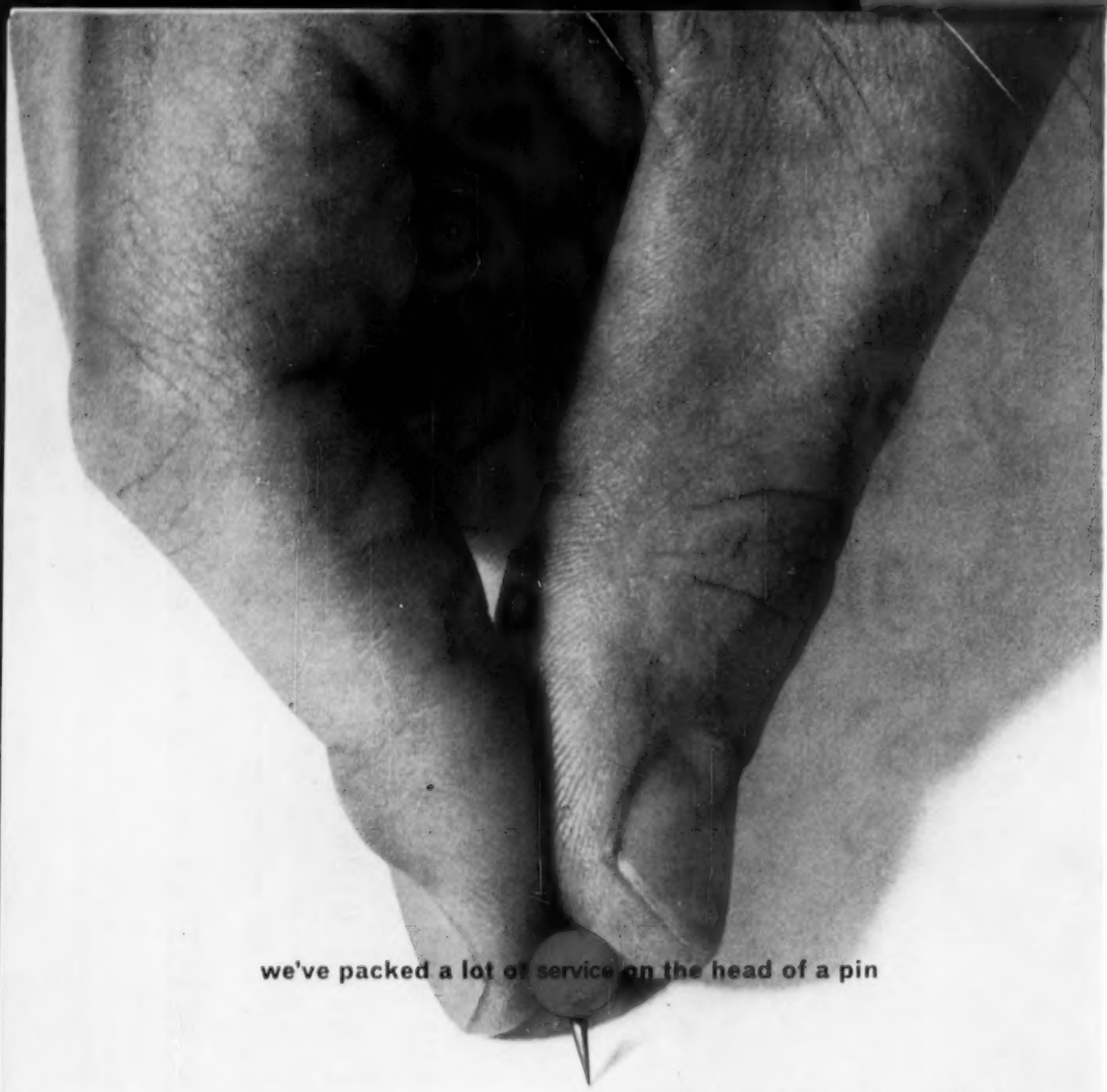
T2V-1 SeaStars will soon go into service with the Naval Air Training Command

9 OUT OF 10 U. S. MILITARY JET PILOTS WERE TRAINED IN LOCKHEED JETS. THE NAVY'S NEW T2V-1 "SEASTAR", BUILT BY LOCKHEED'S CALIFORNIA DIVISION, IS THE FIRST U. S. PRODUCTION PLANE WITH HIGH-SAFETY BOUNDARY LAYER CONTROL.

— — — — —

LOCKHEED *means leadership*

BALLISTIC MISSILE RESEARCH & DEVELOPMENT • ROCKETRY • WEAPON SYSTEMS MANAGEMENT • NUCLEAR-POWERED FLIGHT • ADVANCED ELECTRONICS • ANTI-SUBMARINE PATROL AIRCRAFT • LONG RANGE EARLY-WARNING RADAR CONSTELLATIONS • JET FIGHTERS • JET TRAINERS • COMMERCIAL & MILITARY PROPJETS • LUXURY LINERS



Every pin on the map represents one of the 53 LEAR Approved Service Stations from coast to coast. Each station is fully equipped with the finest test facilities, and staffed with Lear-trained technicians.

The LEAR "shingle" displayed by these stations is your assurance of factory-quality installation and maintenance for LEAR radio, navigational instruments, and flight control systems.

APPROVED SERVICE STATION

LEAR INC., LearCal Division
3171 South Bundy Drive, Santa Monica, California
LC-31

Have You Read?

(Continued from page 8)

you'll fly, I'll ride," came the terse reply.

Reeves did things with the airplane no one had dared before. He built a thriving business airdropping or airlanding men, supplies and equipment wherever a customer wished. The accounts of these flights onto glaciers and mud flats, into inaccessible valleys or Aleutian-island beaches, where nuggets lay for the picking, provide a saga of long adventure.

Glacier Pilot is the story of a true frontiersman and his cronies—a rough, competitive bunch who flew single-engine ships without weather forecasts, communication, airfields or navigational aids, to conquer some of the world's worst terrain and weather. It adds up to one of the most interesting chapters in aviation history. No practical airman can afford to miss this one.

Four new air books for young readers, provide informative and educational reading. Two are fiction: *Jets Away!* by Rutherford Montgomery (Dodd, Mead, $3) is the story of two teen-age airmen in Strategic Air Command. Henry Doby is a "Clancy" boom operator on tanker; Brick Miller, a crew chief on a jet bomber. The plot is woven around the life of these lads in a combat operational bomber wing. Montgomery, author of over 60 books for the young set, spent months living with SAC combat crews to build a story that is authentic, realistic and dramatic.

High Challenge by D. S. Halacy, Jr. (Macmillan, $2.75) is the story of a young man's fight to overcome a physical disability so that he can fly. High excitement occurs when his glider is caught in an up-draft and taken to 20,000 feet.

Two are non-fiction: *Wings Over The Atlantic*, by Robert J. Hoare (Charles T. Branford, $3) is the story of early pilots over the Atlantic. Detailed narrations include flights of Commander Read, Lindbergh, Amelia Earhart, Sir Charles Kingsford-Smith, Jim and Amy Mollison and many others.

Illustrated. *Great Moments in Flying*, by John W. R. Taylor (Roy Publishers, $2.50) is a collection of 12 events in the history of aviation, and the stories of the men of all nationalities who made the events possible.

Beginning with the Wright Brothers at Kitty Hawk, this little popular history ends with the narration of Chuck Yeager's penetration of the sound barrier. Included are such milestones as Byrd's flight over the South Pole, Jack Knight and the U. S. air mail, RAF squadron No. 617—the "Dam Busters," and Bleriot's first channel crossing. Illustrated with line drawings.

where to find

LEAR APPROVED SERVICE

Type of Service:

(C) Communications Radio • (N) Navigational Equipment • (F) Flight-Control Systems • (G) Gyro Overhaul

ARIZONA, Phoenix
Aero Electronics, Inc. CN
Sky Harbor Airport
Sun Valley Air Service CN
Sky Harbor Airport

CALIFORNIA
Hawthorne Bates Aviation CNF
Hawthorne Airport
Long Beach Air Oasis Company CNF
Long Beach Municipal Airport
Oakland Bayaire Avionics CNF
Oakland Municipal Airport
Palo Alto Fred A. Becker Aviation Radio C
Palo Alto Municipal Airport
San Jose Wright Brothers Aviation CNF
San Jose Municipal Airport
Santa Ana Martin School of Aviation CN
Orange County Airport
Santa Monica
Executive Radio & Aircraft Service Inc. CNF
Santa Monica Airport
Van Nuys Plane Service, Inc. CN
Van Nuys Airport

COLORADO, Denver
Clinton Aviation CNF
Stapleton Airport

CONNECTICUT, New Haven
Usher Aviation CNF
Municipal Airport

DELAWARE, Wilmington
Atlantic Aviation Corp. CNF
New Castle County Airport

DISTRICT OF COLUMBIA, Washington
Butler Aviation CNF
Washington International Airport

FLORIDA, Lantana
E. Farnell & Company, Inc. CNF
Palm Beach County Airport

GEORGIA, Atlanta
Southern Aero, Inc. F
Municipal Airport

ILLINOIS
East Alton Walston Aviation CNF
Civic Memorial Airport
Springfield Capitol Aviation CN
Municipal Airport

KANSAS, Wichita
Lear, Inc. CNF
Wichita Municipal Airport

KENTUCKY, Louisville
Aircraft Radio Laboratory CN
Bowman Field

MICHIGAN
Detroit Servair, Incorporated G
Detroit City Airport
Grand Rapids Lear, Inc. CNF
Grand Rapids Airport

MINNESOTA
Minneapolis Minnesota Airmotive, Inc. CN
Wold-Chamberlain Field
Rochester Gopher Aviation, Inc. CNFG
Lobb Field

NEW JERSEY, Teterboro
Atlantic Aviation Corp. CNF
Teterboro Airport
Consolidated Instrument Co., Inc. G
Teterboro Airport

NEW MEXICO, Santa Fe
Southwestern Skyways, Inc. CNF
New Municipal Airport

NEW YORK
Buffalo Buffalo Aeronautical Corp. F
Buffalo Airport
Flushing, Long Island Butler Aviation Service, Inc. CN
La Guardia Airport
Lindenhurst, Long Island Dot Airtronics, Inc. CNF
Zahns Airport
Rochester Page Airways, Inc. F
Municipal Airport
Ronkonkoma, Long Island
Air Mar Radio Service, Inc. CNF
MacArthur Airport

NORTH CAROLINA, Charlotte
Southern Flight Service, Inc. F
Municipal Airport

OHIO
Cincinnati Airborne Communications, Inc. CNF
Lunken Airport
Cincinnati Aircraft, Inc. CN
Lunken Airport
Youngstown Youngstown Airways, Inc. CN
Municipal Airport

OKLAHOMA, Tulsa
Tulsair Distributors, Inc. CNF
Municipal Airport

OREGON
Portland Flightcraft, Incorporated CNF
Portland International Airport
Oregon Air-Motive G
Portland International Airport
Troutdale Skyways, Incorporated CNF
Portland-Troutdale Airport

PENNSYLVANIA, Reading
Reading Aviation Service CNF
Municipal Airport

SOUTH CAROLINA, Charleston
Hawthorne Flying Service F
Municipal Airport

TEXAS
Dallas Dallas Aero Service CN
Love Field
Houston Aviation Instrument Manufacturing Corp. G
International Airport
Allied Instrument Laboratories F
Municipal Airport
San Antonio Airnews, Inc. CN
International Airport
Howard Aero Service CF
International Airport

UTAH, Ogden
Southwestern Skyways, Inc. CNF
Ogden Municipal Airport

VIRGINIA, Sandston
Aircraft Radio Service CNF
Byrd Airport

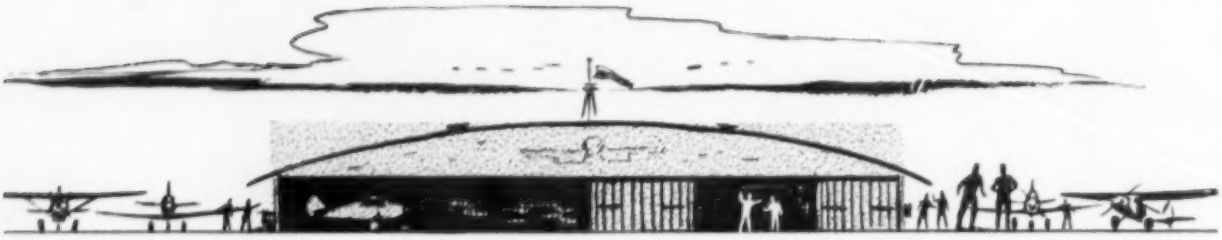
WASHINGTON, Seattle
Airline Services, Inc. C
Boeing Field

WISCONSIN, Milwaukee
Anderson Air Activities CN
General Mitchell Field

CANADA, ALBERTA — Calgary
Foothills Aviation, Limited CNF
Municipal Airport

CANADA, QUEBEC — Montreal
Laurentide Aviation, Limited C
Cartierville Airport

Lear APPROVED SERVICE STATION



HANGAR FLYING

WEATHER FLIGHT

STATISTICS SHOW THE most dangerous period in a military pilot's life to be when he's logged about 500 hours. That's when he knows it all.

In 1943 I was instructing Naval cadets at Corpus Christi, Tex. On the particular day ear-marked for my "come-uppance" the weather was stinko. However, an overcast that started about 150 feet off

Major Tom Saxon

the deck didn't look too thick. Several light spots could be seen over the field.

I was in the ready room when the squadron duty officer came in. "Hey, Sax, how about taking the weather hop? Aerology reports this stuff is only about 100 feet thick and will burn off in half an hour. Take a run out over the gulf and see how it looks for overwater gunnery later this morning."

That's all I needed to hustle me into my flight suit and mae west. I stopped by the operations office, told them I was taking the weather hop, and would "take one of the gunnery planes because it was near the end of the flight line, next to the taxi strip."

Then I headed for the line, not bothering to check the latest sequence reports, or related information. The light spots in the overcast had disappeared—but I could fly any kind of weather the aerologist could spell—besides the soup was only 100 feet thick and would burn off in 30 minutes . . . the SDO had said so!

Reaching the plane, I found one of the squadron's radiomen waiting. "Mind if I go along, Lieutenant? I need some time on this month's flight skins."

"Glad to have you aboard, Sparks. Get in and saddle up."

Those thin clouds seemed mighty thick at 1,000 feet above sea-level. Oh, well, I'd probably break out in a minute, then I could find a hole to let down through. At 3,000 feet my palms were damp and I wondered how one SDO could be so stupid as to tell me "the stuff was only 100 feet thick."

At 4,500 feet, I broke out between cloud layers. I decided to tool around between layers until I found a hole. I'd had enough needle-ball-airspeed for the time being. The idea was okay, but the cloud layers converged a minute later and I was on the gauges again. "Gotta get down out of this stuff, pronto," I gulped aloud.

Reaching down to switch the radio receiver to low frequency, I was in for another shock. No low frequency receiver! It had been removed, since gunnery planes normally didn't need it just as they didn't need gyro instruments.

No gyro horizon and no range receiver. Now what would a hot pilot do? I decided to try to get under the stuff. By the time the altimeter showed 500 feet, I'd established a 100 fpm letdown and was peering alternately at the panel and toward the ground, hoping to break out. Four hundred feet, 300, 250, 200, 150, 100, 50! Jumping catfish, the water!

I hauled back on the stick and slammed on the throttle just as the bottom of the plane nipped a wave. It took 20 minutes to climb out on top of the overcast at 10,000 feet. We churned around for another 30 minutes, looking for a hole. Nothing but clouds in every direction.

"Navy 3451, this is Waldron Tower. Over."

"This is Navy 3451. Go ahead, Tower," I answered.

"Navy 3451, this is Waldron Tower. Aerology now reports that the ceiling is down to 50 feet, with tops at 10,000. Overcast extends inland and up and down the coast for approximately 200 miles. Suggest you head inland and land at the first open field. Over."

I checked my gas supply and figured rapidly. I didn't have gas to go 200 miles . . . even if I had known exactly what my present position was.

"Waldron Tower, this is Navy 3451. I don't think I've got enough gas to make it to an open field. Over."

"Navy 3451, this is Waldron Tower. What's your present position in relation to the radio range station and field? Over."

"Your guess is as good as mine. I haven't got a low frequency receiver. All I know is that I'm at 10,000 feet. What are your instructions? Over."

"Navy 3451, this is the Squadron Commander. Use your own discretion. Over."

"This is Navy 3451. Roger. Out."

The radioman in the rear cockpit piped up. "Guess we're lost, eh, Lieutenant. What're you gonna do?"

"I'm going to try and get this plane down, Sparks. If you want to bail out, I'll head west until I'm sure you'll land somewhere in Texas when you jump." I could still find Texas, I hoped.

"If you're going to ride her down, then so will I," the intercom answered back.

Just as I was setting the plane up for another let-down attempt, I spotted a hole—not big enough to let down through but large enough to take a squint and get my bearings. I saw a small lake that looked familiar. Doing a bit of calculating, I decided the field was ten minutes flying time southwest.

Ten minutes later I started a square-pattern let-down, using two-minute legs. Again I decreased my rate of descent when I reached 500 feet. The altimeter continued to unwind with nothing but clouds below. Better climb back up. At the moment I eased on power and started to pull the nose up, I saw the ground. I had broken out at 50 feet.

Skimming over the scrub brush, I looked for any pasture that would serve as a landing field. Then a telephone line popped up! I jerked back on the stick, hurdling the line with inches to spare. Better climb and bail out, I thought. Before I could crack the throttle, I picked up a field—dead ahead. Dropping landing gear and flaps, I made a low turn into the runway. Then we were down, rolling smoothly along our own field. But did you think I was proud of that performance????

MAJOR TOM SAXON, U.S.M.C.
North Miami Beach, Fla.

CARBURETOR ICE

WHEN WE HEARD that the cold front passed Waco, Tex., leaving low ceiling and freezing temperature, my student Hank and I were on the verge of calling it a day and not waiting our turn for the Piper J-3. However, I hated to waste a Saturday afternoon and besides, Hank needed additional practice in view of the approaching flight test for his instructor's rating. So when the Cub taxied up and

(Continued on page 79)

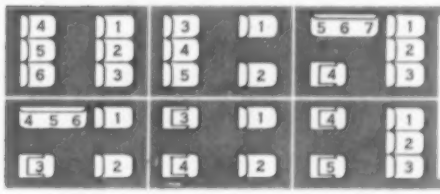
TIME...AND MOBILITY

the most of everything for you!

There is only one business airplane in the six-place field that has everything — the big, beautiful Beechcraft Twin-Bonanza!

The Twin-Bonanza for '57 delivers more power, carries more payload, has greater range, gives better performance, is more quiet, has better visibility, compiles a better safety record, comes more fully equipped, has more comfort features, adapts better to your individual needs, and has a higher resale value than any other airplane in its field!

For a demonstration ride and operating facts about the Twin-Bonanza, and the finest financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas.



six luxurious seating arrangements

Unexcelled comfort is yours in the beautifully styled interiors of the Twin-Bonanza. Choose from six seating arrangements, illustrated at the left.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

"Bernie" Fenwick, outside Friendship International Airport's Terminal Building. Directly behind him is a Constellation operated by Eastern Airlines, one of Pan-Maryland's airline customers.

"There's no ceiling on success when you fly with Shell!"

says G. B. Fenwick, Jr., President of Pan-Maryland Airways. P-M boosted its gallonage fiftyfold in six years as a Shell Aviation Dealer at Friendship International Airport, Baltimore

It's no wonder Bernie Fenwick is happy Pan-Maryland teamed up with Shell in April 1951. At that time, one truck was more than enough to handle their business. Three months later, thanks to Shell's help, they began making into-plane deliveries to the airlines.

Today, Pan-Maryland has 13 trucks busy fueling and servicing the airlines, private airplanes, jet fighters of the National Guard, police department aircraft, helicopters, military

and government-owned aircraft and dozens of corporate aircraft.

"We've got an extremely diversified operation here," says Bernie. "Pan-Maryland handles everything from Cubs to F4D Navy jets—from Mites to B-52's.

"Consequently, we handle the complete line of Shell Aviation Fuels, including Shell Turbine Fuels for jet planes and commercial turboprop airplanes.

"Shell also provides us with a full line of AeroShell lubricants, fluids and greases to fit our customers' needs. What's more, we get up-to-date technical advice from our Shell representative who's always at our service."

When Bernie talks about the services Pan-Maryland gives its customers, he emphasizes that delays are almost nonexistent. All pilots have schedules to meet and what they want most of all is fast, efficient, on-schedule service.

A "Customer's Service Report" is mailed to every flier who stops at the field. It invites comments and criticism of service, workmanship and courtesy. Replies like "Best service I've ever gotten—anywhere," "Excellent in every way," "Keep up the good work," are received every week from all over the country.

Bernie points out that their CAA Certified Repair Station is going to be finer than ever. A big new hangar will be completed soon and he plans a Class 4 shop there, with service crews qualified to work on every type of plane.

Other plans for the future include branching out into airline ramp service, setting up an aircraft sales department, building more hangars *and boosting gallonage still further.*

"After all," says Bernie Fenwick, "the sky's the limit with Shell."

Private planes get first-class treatment, too. Every civilian pilot who uses the field receives a "Customer's Service Report" which requests suggestions for improving service.

The Boeing 707 jet transport is fueled by Pan-Maryland with Shell fuel at Friendship International Airport after its recent record 3-hour, 48-minute transcontinental flight.

Bernie discusses plans for future expansion with Col. J. Colonna, Airport Director.

It pays to be a Shell Aviation Dealer

—and the Shell office nearest you will be glad to show you why

SHELL

One Breed—One Purpose

GILL ROBB WILSON
Editor and Publisher

WITH this August issue of FLYING, 30 years of continuous publication under the same ownership have been racked up—a record of stability for a publicly distributed magazine in the aviation field.

The present staff, whose stewardship extends over only the past five and one-half years, can take no credit for the three decades of constancy behind . . . but does find satisfaction in the latest semi-annual report of the Audit Bureau of Circulations that, among the 169 national magazines having a circulation of more than 100,000 copies monthly, FLYING stood second in highest percentage of gain . . . the only aviation magazine in history ever to attain stature among this group of publications. Currently monthly sales run as high as 223,000 copies.

The satisfaction of the staff, however, is not in the mere statistics but in their implication for the growth and public appreciation of all facets of aviation. We accepted the stewardship of this magazine with the firm understanding that its mission was to serve the aviation destiny of the American people. We cater to no single segment of aviation, fish for no exclusive audience, represent no cause less than the whole. Our average of voluntarily submitted manuscripts exceeds 400 monthly, our letter input from readers is several thousand, and our subscribers hail from 83 different countries and principalities. Reprints of various industrial and concept articles run into hundreds of thousands annually.

We are exceptionally proud of our contributors whose total of experience runs the gamut of aviation activity from the newest student pilot to the central figures of science and engineering, test piloting, airline operation, military statesmanship, manufacturing, business flying, education, or soaring. If Joe Doe knows something that will help other airmen his by-line is as welcome in FLYING as that of C. R. Smith, President of American Airlines, or Don Douglas, President of Douglas Aircraft, or Don Quarles, Deputy Secretary of Defense, or Tom Watson, President of IBM, or Admiral Carney, CINC of Navy or scores of other eminent ones who have written for us. Such a thing as a rejection slip is unknown in FLYING. Only a small fraction of manuscripts can be published but every single one is avidly read in search for that which will best serve the whole of aviation.

Constantly through the pages of the magazine runs a thread of urgency to open the doors of aviation wider and wider to the youth of the land, and to motivate youth to examine aviation for career possibilities. This is no part of a sentiment for youth as such, but rather a hard appraisal of the country's necessity and a pointing out of where opportunity can return big dividends. Our staff embraces an aggregate of 115 years of pilot experience, military and civil, and reaches into almost every phase of aviation endeavor. Each of us is convinced that in both tangible and intangible rewards, the man or woman in aviation has had the best the times could offer. We judge it will be scarcely possible for any intelligent individual of the coming decades to be at home in his or her world without a sound concept of the meaning of the air age.

In the matter of how magazine space shall be divided as between civil and military flying or as between various other segments of aviation—our policy has been and will remain as follows: there is no conscious division. Aviation is not a hobby but a way of life. The interests of no airman worth his salt are confined to his own cockpit. Our common problems are too great to ignore in favor of divisive emphasis. We cannot always be profound but we can be simple, direct and practical.

One of our highest rewards comes in letters or phone calls from some pilot or other who tells us that he owes his safety to some article in which he read of the experience of a fellow pilot. This is the reason we continuously carry many items reflecting airman experience around the world. It is the judgment of our staff members that we ourselves have survived long years of flying because of what fellow pilots have taught us. And this is especially the case in view of the constantly changing conditions which arise as aviation multiplies and progresses.

Perhaps the biggest reason that we have so much downright happiness in publication of FLYING is that the myriad details of it keep us in intimate touch with what we hold are the world's best people—our writers and readers, the ones who build the air age and the ones who back up the builders with their interest and concern. Long may they both endure—one breed, one purpose.

TOPS THEM ALL IN AIRCOACH TRAVEL

THE ROYAL COACHMAN

Nonstop–

New York-Los Angeles $99 plus tax

Washington-Los Angeles $98 plus tax (over two hours faster than any other aircoach)

- the most famous luxury aircoach service
- America's fastest airliner–the DC-7
- reserved seats, lounge, meals served aboard (when purchased with your ticket)
- most frequent luxury coach service between New York and Los Angeles
- the only luxury aircoach between Washington and Los Angeles

AMERICAN AIRLINES

America's Leading Airline

Practice on single engine flight instills confidence. Engine-out maneuvers are repeated until the new owner has developed skill in handling emergencies.

Left: A new owner is shown the operation of controls on Apache pedestal. Pilots are thoroughly briefed on all systems prior to starting the engines.

Below: The author indoctrinates Mr. Arthur Whiteway in Apache systems. Here they study safety feature of fuel filler cap during pre-flight inspection.

Owners gain new confidence in
their planes as well as in their own abilities
when they complete standardized

Transition to Twins

By HOWARD GRAVES

Chief Check Pilot, Piper Aircraft Corp.

WITH THE ADVENT of light twin-engine aircraft, suitable for corporate transportation, many pilots are faced, for the first time, with the complexity of multi-engine aircraft cockpits.

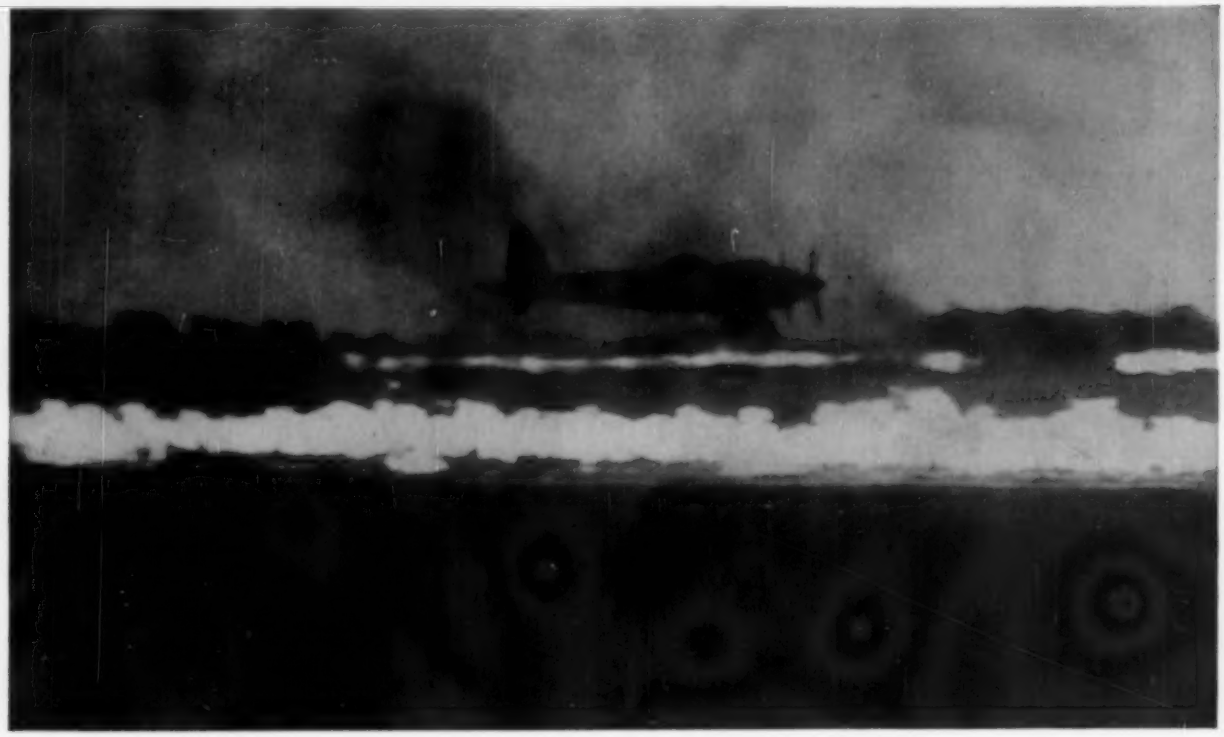
The advantage of an additional engine, greater horsepower, and longer range, has led to over-confidence in numerous instances. Pilots, thoroughly experienced in single-engine planes, have been unaware of the importance of complete mastery of emergency procedures peculiar to multi-engine flying.

CAA, in issuing its "Multi-Engine Aviation Safety Release No. 400" took official recognition of this fact that a majority of twin-engine mishaps were directly attributable to pilot mishandling of emergency procedures. They pointed out the urgency of a comprehensive knowledge of the operational capabilities of multi-engine air craft; and of thorough indoctrination by newly rated pilots.

Piper, builder of the Apache light-twin, immediately compiled a practical transition syllabus for single-engine pilots "graduating" to twins. The company recognized that the high performance of the Apache could easily tempt a pilot into over-confidence. Also to guard against this, a transition program was adopted, featuring a thorough demonstration of emergency conditions and impressing on pilots the necessity of practice in emergency procedures. This course is standard throughout Piper's world-wide organization. Every distributor has at least one pilot who has gone through the Check-Out, and many dealers are now so staffed.

Indoctrination begins with a review of all literature bearing on Apache operation—Owner's Manual, Check Lists, Weight & Balance, Flight Calculator, Power Charts, and CAA Release No. 400. The Piper representative and the new owner discuss the contents of these documents to assure that the latter fully understands them, and appreciates the importance of the (*Continued on page* 70)

Single engine approach with right prop feathered. Flaps are not applied until no doubt remains that landing can be accomplished safely.



FIDO WAS NO DOG

By DAVID WEST

GENERAL VON RUNDSTEDT, German army commander, launched his last desperate attack in the Ardennes, at a time when he was sure the Royal Air Force would be grounded by weather. His meteorologists had told him fog would envelop the battle area.

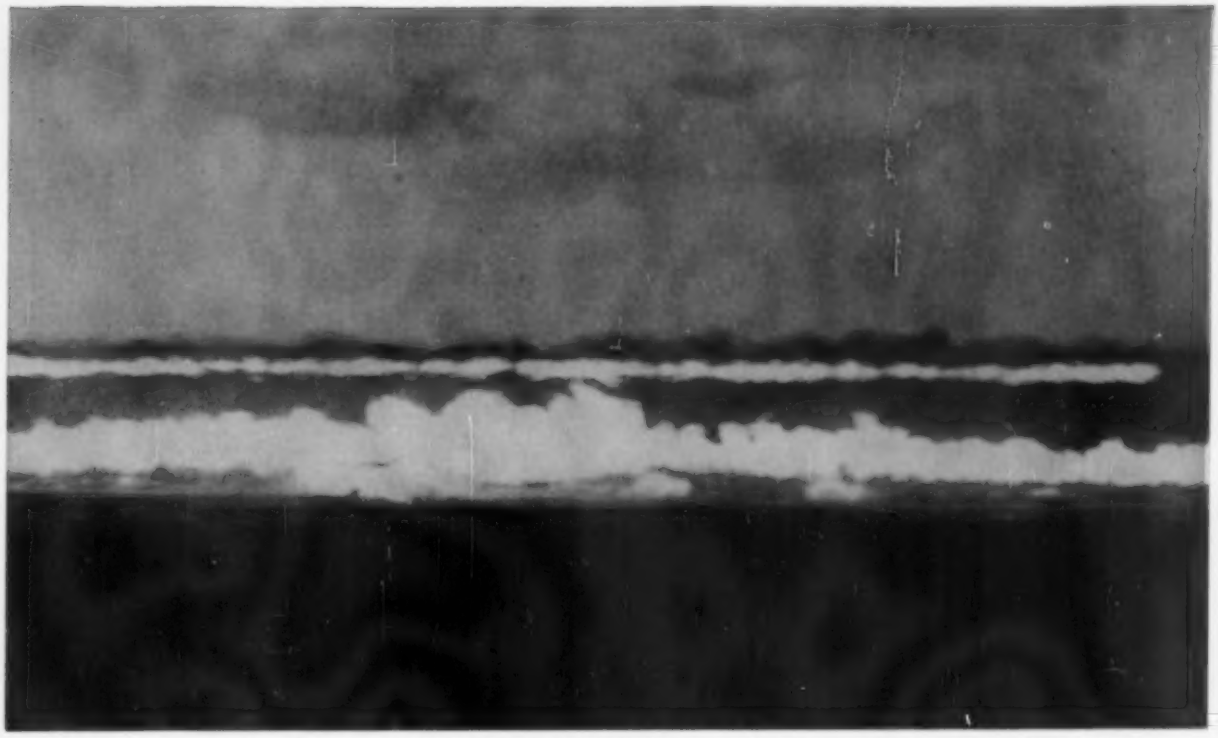
Further they said, fog would persist over the whole of the British Isles, putting every airfield out of commission during the critical stages of his campaign. The fog was there all right. It stayed for days and did in fact put many British airfields out of service. To Rundstedt's dismay, however, British bombers attacked in great force night after night, smashing vital positions and causing the failure of his plan.

The bombers were able to take off from and return to their fog-bound bases in spite of the fact that visibility was reduced in many cases to 50 yards. This was made possible by a development known as FIDO. The name was derived from the initials of the project, Fog, Investigation Dispersal Of.

Fog in England had proved a great enemy of Allied fliers. They lost thousands of hours of training time, as well as precious lives and aircraft. The weather anxieties with which pilots often had to contend upon return from missions over Germany doubled their fatigue. Navigation aids could help them to within several hundred feet of the runway, but then they were helpless without sight of it. Fog over Britain became more of a menace than flak over Germany, and losses mounted as the RAF bomber offensive was stepped up during 1941 and the spring of 1942.

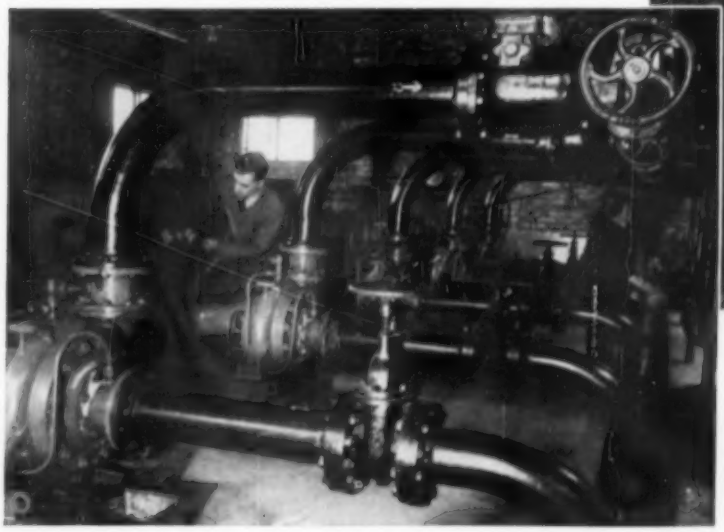
Prime Minister Churchill was greatly concerned as the number of casualties increased. To the Minister in charge of the Petroleum Warfare Department, Mr. Geoffry Lloyd, he sent a message that "full experiments" be inaugurated.

And so the race was on. Lloyd called together fog experienced pilots, meteorological experts, research scientists and engineers to pool their efforts. Red tape between departments was cut. Imperial Chemical Industries, the General Electric Company, the Gas Light and Coal Company, the Anglo-Iranian Oil Company and the London Midland and Scottish Railway supported the project with their vast technical resources. (*Continued on page* 62)



An RAF Mosquito lands on a fog-bound airfield in England during WWII. Such a landing could only be made by means of FIDO.

Coming down into the glare between two lines of burning oil was quite a sensation—like diving into an inferno—but thousands of Allied pilots welcomed the experience.



Above: A single line burner starting an experimental burn. Later installations used two lines each side of the runway which gave better results. Burning fuel at the rate of 75,000 gph, it took 15 minutes to clear runway of fog. Left: Oil pumping station at an RAF base fed by pipelines from oil dumps set all over England. These stations could feed the burners on larger runways at over 200,000 gph.

PERSONAL PARADISE

Magnificent Blakely Island, just off the Straits of Juan de Fuca on the Canadian border, boasts a 2,300-foot airstrip visible at left.

Clear approaches are excellent for twin and single engine planes.

BY COMBINING TWO of America's most distinctive and popular sports, flying and boating, Floyd Johnson, former airport operator in Portland, Ore., is developing a paradise for both activities. Few people ever seriously expect to own an island estate but in San Juan Aviation Estates, the remote possibility has become a reality.

Several years ago, Johnson, having succumbed to the primitive attraction of Blakely Island, bought it with the idea of establishing an area where people could buy such land as they wanted for recreation purposes. A good airstrip with safe approaches and a natural yacht basin are basic features. Plans call for even further development of these facilities.

Just off the Straits of Juan de Fuca, Blakely is located immediately south of Orcas Island in the heart of the San Juan island group and is conveniently and readily accessible by air. If one's first love is boating, the trip to Blakely is one of scenic beauty through Puget Sound, the fastest

FOR PILOTS

Right: The airstrip at Blakely Island (upper right) as seen across the yacht basin. Right, center: The clubhouse at the north end of the strip is focal point of social life on the island. Right, bottom: Jeep meets aerial arrivals.

Whether your first love is flying or boating, Blakely Island, in the Sunshine Belt of the Northwest, is a land of enchantment.

By BETH THOMAS

growing aquatic sports area in the United States.

Official weather records of the past 40 years tab the San Juan Islands as the Sunshine Belt of the Northwest, and Blakely, where the maximum tidal range is 11 feet, lies peculiarly in its own sheltered position aside from the wind path sweeping inland off the Pacific. Here temperatures run about 15 degrees higher than on the mainland, and higher even than on neighboring islands. The average annual temperature is 58 degrees. By seasons, the average is spring (58°), summer (68°) and autumn (60°). Often, when nearby Seattle is soggy, Blakely basks in sunshine. Average rainfall is a moderate 29.04 inches compared with 39.91 in Portland, 210 miles to the south. In the matter of pure water, Blakely is blessed with a fine, fresh-water lake. Even now in the early stages of development, all of the buildings and facilities are abundantly supplied with water and electricity.

Estate sites have been laid out so that each has its own unique setting. One purchaser may want the seclusion of an inland location, another the convenience of a plot adjoining the airstrip, or a third a site fronting on the yacht basin; but whatever the choice, the setting is gorgeous. Size of the plots is varied according to desire. A property owner builds his own "estate" or contracts with Johnson if he so desires. Materials and labor are readily available and financing may be arranged both for land and construction. To the property owner goes legal title to his site and privileges of the general facilities—the 2,300-foot airstrip, the yacht basin, the two lovely lakes set aside for swimming and fresh water fishing. Wild fowl and game are plentiful, and the salt water fishing and clamming are excellent.

For the naturalist, the tree growth on Blakely is exceptionally abundant. Madrona trees are particularly plentiful, and one may find all varieties of fir, as well as many broad leaf species including maple, alder and dogwood. As is true anywhere in the Northwest, west of the Cascades, there are no poisonous (*Continued on page 85*)

Noise and thrust reversal, two acute problems plaguing the future of jet airliners, are being solved by Curtiss-Wright.

HUSHING THE *JET*

By ALEX DAWYDOFF

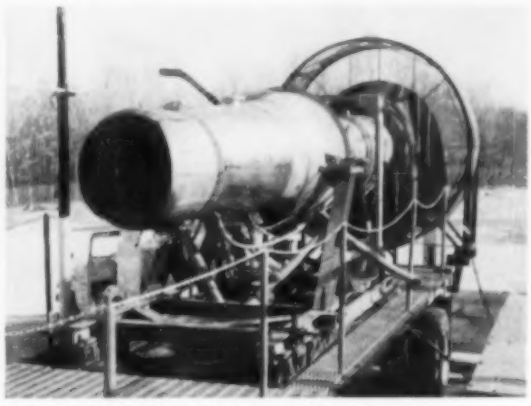
JET AIRLINE OPERATION advanced another step with the recent announcement by Curtiss-Wright Corporation of its new turbo-jet engine, the TJ-38. Developed jointly by the Wright Aeronautical Division of Curtiss-Wright and the Bristol Aeroplane Co., Ltd. of England especially for commercial air transport use, the twin-spool powerplant develops 12,500 pounds of constant thrust, is lighter, more economical and considerably quieter than most engines of equal power. Noise has been one of the principal drawbacks to the future of commercial jet operations. Communities adjacent to passenger air terminals have constantly objected to the high noise level of piston-engine airliners. Jets are acoustically even more strident and jet airliners have been banned from such airports as New York International and La Guardia by the Port of New York Authority for fear that those who live in their vicinity will rise in rebellion and force the closing of the terminals. So far the only exception has been the French twin-jet transport "Caravelle" for which the Port of New York Authority has lifted the ban after an intensive study that proved its noise level to be equal or less than that of propeller-driven air transports.

The reaction of human ear to sound is difficult to measure. Scientists and acoustic engineers use such terms as "decibels" and "frequency" for a yardstick to denote its volume and pitch, 100 decibels being the limit of public acceptance. Another factor affecting the hearer's reaction to sound is its duration. The longer it lasts, the more annoying it is. (A long blast of an automobile horn is much more aggravating than a short honk, though the decibel values of both are alike.)

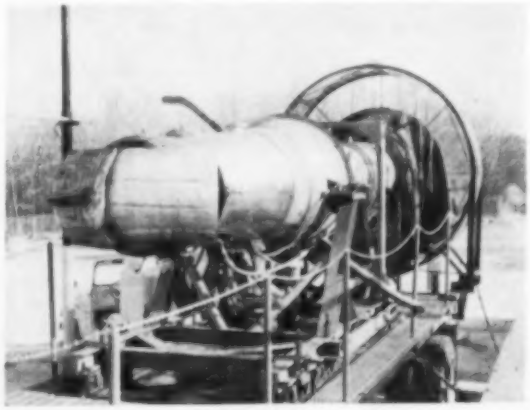
Noise suppression of jet engines is not easily achieved. You cannot put a muffler on them. The noise itself is the result of shearing action between the high velocity exhaust gases and the outside air, (*Continued on page 92*)

Wright TJ-38 commercial turbojet measures 121 inches in length.

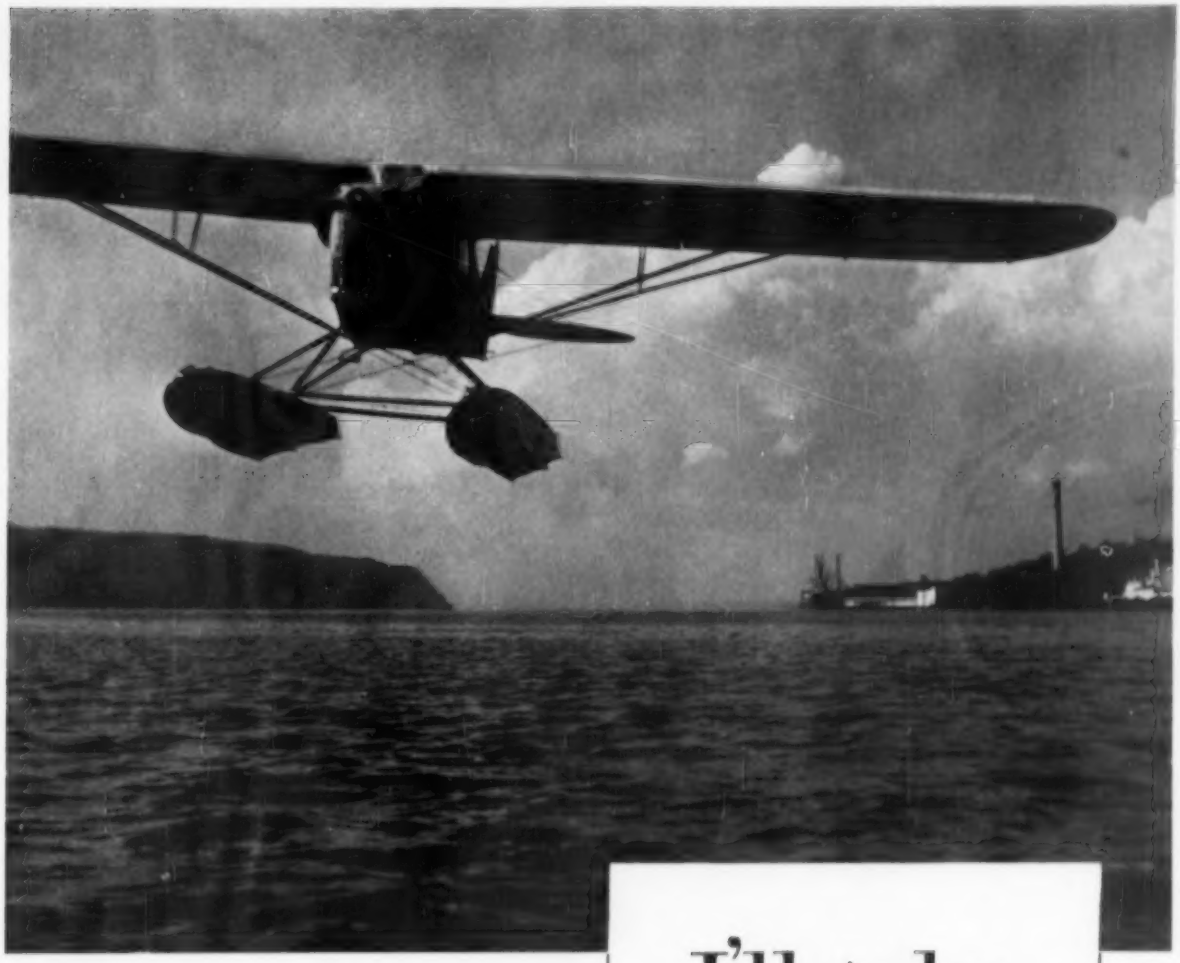
Curtiss-Wright's President, Roy T. Hurley points at the segmented suppressor. Looking on are: J. O. Charshafian, Director of Engineering, left and J. V. Miccio, Gen. Mgr. of Wright Aero.



Thrust Reverser in closed position. Exhaust gases hitting the deflectors flow forward exerting powerful braking force on airframe.



Thrust Reverser in open position. Shown here mounted on mock-up of Republic F-84F's rear fuselage. Engine is a Wright J-65.



I'll take seaplanes

If you are tired of the scenery around your local airport or are looking for something different—try float flying.

By ROBERT F. SULLIVAN

I HAD HEARD float pilots were a breed all their own—intolerant and ingrown, but in spite of these rumors, I was driven by an urge to have a go at seaplanes. This presumably was prompted by the miles and miles of beautiful coastline around my home. Admittedly, I am a professional New Englander. I love the sea and everything about it. Learning to fly at Newport, R. I., I soon found that wherever I wanted to go from there, I ended up flying over water shortly after take-off.

By the time I actually got around to seaplanes, I had accumulated a few thousand hours in land planes of all sizes and shapes and several hundred hours in helicopters, and was in a position to evaluate this educational process.

By way of a start, I bought a copy of the "Seaplane Directory" from the Supt. of Documents and looked up all the bases in the area. There was one at Fall River, Mass., a few miles away, operated by Phil Desmaris. Phil was in process of retiring and not in the mood to take on a student. But finally had compassion and agreed to give me instruction. The next few days of bad weather, Phil and I sat in his office and talked seaplanes. I learned things I had never even dreamed of.

Phil is one of those characters one rarely meets—a veteran of WW I who flew 13-meter Nieuports but has been flying seaplanes ever since. I was in good hands. At the time, he had a J-3 and a PA-12 on floats. A hurricane of the previous year had done in his Seabee. I selected the J-3. First, I like it. I feel that if I can fly a tandem from the back seat, I can fly it from either seat. Also when learning to operate in a different medium it is good to work with an airplane one knows well.

Starting actual flying, I got a (*Continued on page* 64)

THE AIRMAN'S WORLD

The wind was the magnet which drew
the sons of the Bishop to the dunes of Kitty Hawk.
Propulsive power for their wings was hard to come by.
They drafted the wind.

But the wings were frail and where too little wind was useless,
too much was disastrous. The first airmen had to contrive
a measuring rod of the wind—some device he could interpret
from aloft as well as from the ground.

The wind sock was the answer.
Whether Orville and Wilbur, or some other, first fashioned it,
is lost lore but it swiftly became the universal
identification of landfall for the airman.
For two-thirds of the first half century of powered flight,
the wind sock welcomed and warned the brash men and their planes.
Without exception, the ships of those years
were underpowered and the airman played the wind
as he no longer does. He came over the field lower
than low to read the message of the sock,
pulled up into a chandelle, chopped his power, slipped steeply
to the ground and kicked his nose into the wind
as he sat down in a full stall.
It was fun to do, lovely to watch and saved shock cord
and wire wheels from taxiing on rutted fields.

The wind sock was often a creation of caprice.
In turbulent air it would wrap itself around the pole
and dare you to guess the gusts. In icing conditions it would
freeze fast with sleet and tell you lies.
And in too much wind it would shred away
to bits of whipping rag.

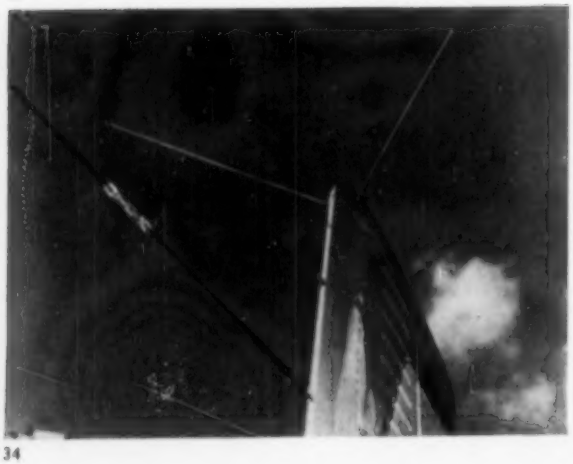
The wind sock is passing now—
gone with the goggles and the starting booster and the tailskid
and the biplane itself—gone with the gunnery roll
and the falling leaf and the Jenny Immelman—
gone from almost everywhere except the nostalgic memory
of the breed which had no runways and no tricycle
gear and no tower to identify them as a blip on a scope
or give them a number in a stack or reassure them
on glidepath, as they groped with dusty tanks for a glimpse
of the ground and a flicker of motion that was a wind sock.
But this is progress and it is good.

GILL ROBB WILSON

1.

The long shadow of ARC

2.



3.

COMMON DENOMINATORS in educated forecasts of air commerce over the next decade shape up about as follows. Passenger volume will more than double and cargo volume quadruple. Jet transports of medium and long-range will move around Mach 2 speed. The carrying capacity of the vehicles will approximately double. Use of business aircraft will more than keep pace with scheduled increases.

If this consensus of informed opinion even approaches realization by 1967, the immediate future of aviation enterprise is pregnant with developments of many kinds—air terminal modernization, aircraft design, powerplant adaptation, and most challenging of all, the machinery of communications which will permit an unparalleled volume of traffic to operate at an unparalleled tempo.

Shortly after the late world war, I frequently was asked if the definition of airpower could be clarified in the light of so much recent aerial experience. I replied that, "Its vehicle now being taken for granted as utilitarian to national policy, airpower is the degree of electronic effectiveness by which a nation, above and beyond any possible interference, can direct its airborne carriers for commerce and defense."

Admittedly, this was an oversimplification made to call attention to a critical requirement of the future—unfailing communications for the man in the cockpit. But it had a large element of truth. The sky is vast, but the areas above great concentrations of humanity are not vast in relation to a volume of traffic moving beyond the speed of sound. Therefore, one of the most vital facets of air progress is communications.

In this field, the stature of the subject of this sketch, Aircraft Radio Corporation, throws a long shadow.

The first contract air mail carriers, attaining a new standard of dependability by virtue of radio, were equipped with ARC sets.

The first radio beacon receiver, standardized by the Army Air Corps, was designed and manufactured by ARC.

It was ARC which developed and installed the equipment used by "Jimmie" Doolittle in the first successful "blind landing" in history.

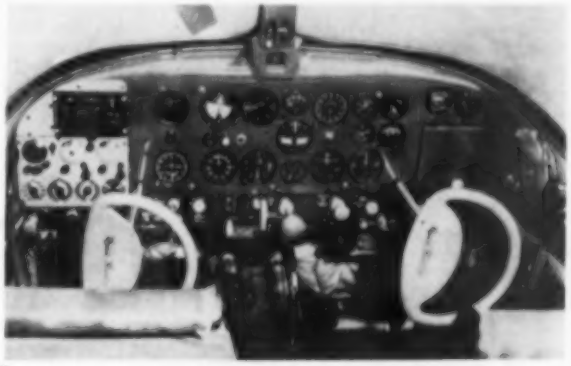
Another "first" was ARC's radio-telephone for two-way use in fighter aircraft, standardized independently by both Army and Navy. As a matter of fact, from the time it purchased its first aircraft, a Fokker Universal, in 1928 and built its own laboratory and flying field at Boonton, N. J. to conduct airborne research, the company for some years was the prime government supplier of such equipment.

Although the emphasis of Aircraft Radio Corporation has meantime largely shifted from government supply to miniaturization of equipment (*Continued on page* 82)

A sturdy pioneer of air age communications, Aircraft Radio Corporation is a leader in aviation electronics.

By JOSEPH VOLNEY

4.



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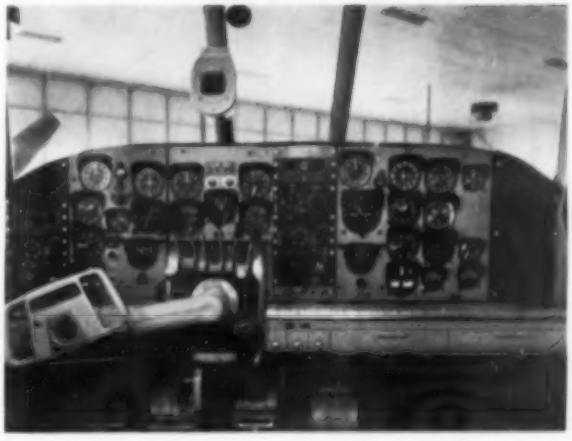


6.

1.
Aircraft Radio Corporation's factory, laboratory and executive buildings and private airport occupy 130 acres at Boonton, N. J.

2.
Omni antenna mounted on top of vertical fin. The after end of the sense antenna with its insulator is also visible.

3.
Two ADF loop housings of ARC's Type 21 protrude only two inches from skin on Twin Bonanza's belly. Between the two loop housings is a VHF L antenna and a sense antenna for the second ADF.

4.
Omni Glide slope antenna of ARC's Twin Bonanza above the cabin.

5.
ARC UHF and VHF communications equipment installed in Ryan Navion.

6.
ARC's Twin Bonanza shows pilot's controls of radio on the left, duplicate controls used by pilot or co-pilot in the center and a blank panel at the right for experimental equipment.

Family disapproval did not daunt this prize-winning cook and mother of three from realizing her ambition to become a pilot and fly her own plane.

THE LADY FINALLY HACKED IT!

By IDA F. DAVIS

"START LOOKING ME up a new wife," said J. T., my husband. "When you get yourself clobbered, the youngsters and I will need one."

And this merely because I had suggested that the two of us might try our hand at flying.

As time rocked on, I didn't do anything about it but the idea persisted. I read all I could find on the subject and everything I read whetted my appetite. And finally one afternoon, after a great amount of badgering, J. T. consented to take me to the airport. We had no trouble locating a flying service ready and willing to take us for a trial flight in a new, four-place Cessna 170. I don't know exactly what I had expected, but it was certainly different from anything I had experienced in an airliner. J. T. didn't have any difficulty expressing his feelings. He was air-sick.

It took me two weeks to get J. T. out to the airport again, and to be truthful, I didn't try too hard. That first flight was on the afternoon of a hot day. The air was plenty "rough." But I had talked too much to back out. The air was smooth this second time. I was beginning to enjoy it. J. T. said he liked this flight, although he still got slightly ill.

It was decided I would report next day for my first lesson. I thought that was all there was to it. What a rude awakening! Now I was asked, "Do you have your Medical Certificate.

"Medical Certificate! What's that?" Whereupon it was explained to me that I must get this certificate and carry it with me at all times while flying.

Several days later I reported at the airport with the certificate only to be told I would now have to get a Student Pilot Certificate, also, an Airman Identification Card. I had my picture made, a one-by-one-inch size. Armed with this and my birth certificate, I appeared before the CAA Examining Agent on his regular scheduled day here at Lubbock.

My first air-work consisted of straight and level flight

and gentle turns. On succeeding days I practiced steeper turns, left and right climbing and gliding turns, touch-and-go landings, and power-on and power-off stalls. I was a little nervous the first day I practiced stalls. On my third try, the stall warning indicator didn't "beep" or else I didn't hear it. I kept pulling back on the wheel until the plane was standing on its tail. It tipped sidewise and slid down the sky. I turned everything loose and yelled, "Hey, Bob! do something."

I was learning a great respect for that 170; so was J. T. —that's right, J. T. was flying by now. He had hung around the airport until I had three hours, then he just couldn't stand it any longer. He soon got over airsickness. One day he was out practicing straight and level flying, all tensed up and struggling to keep the plane on an even keel, when Bob said, "Turn everything loose." To J. T.'s surprise the plane flew itself. That's when the bug really bit him.

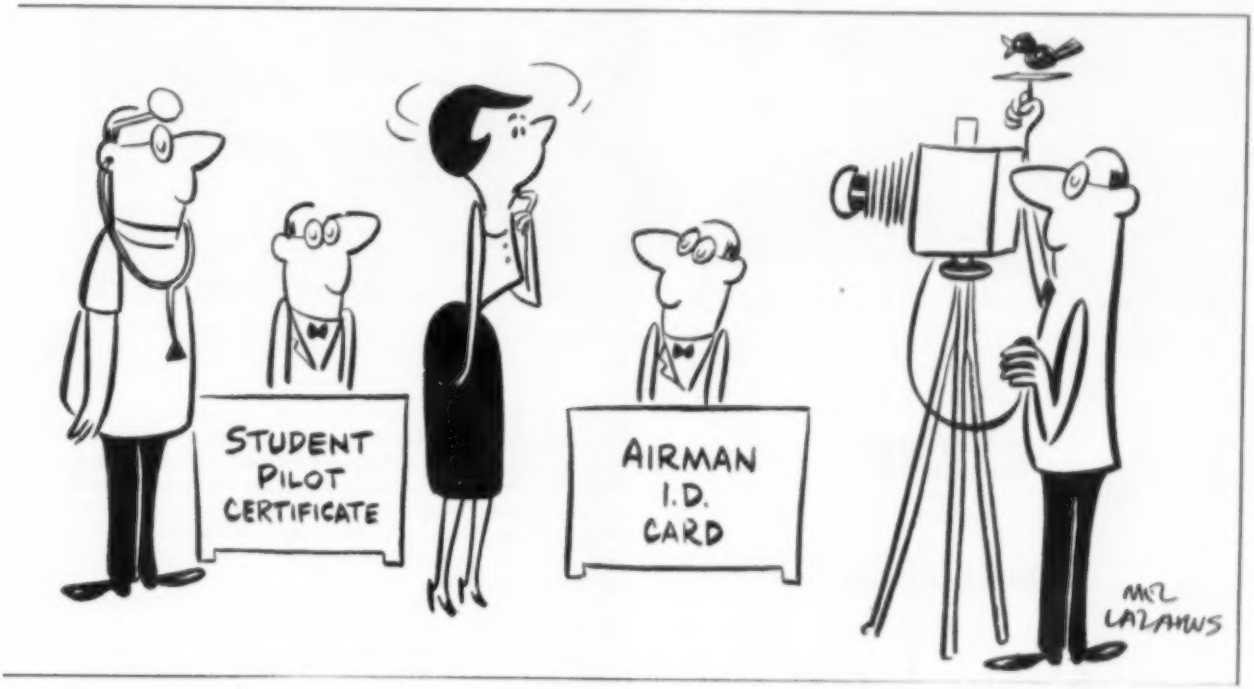
At seven hours I was making good take-offs and landings. Then for some reason, I couldn't seem to get the plane on the ground and keep it there. I'd crow-hop down the runway or bounce so high I'd have to take off again. I now believe this was caused by fear that I would soon be expected to solo.

I wanted to solo. Most students do, but that first flight alone is a challenge. Around Lubbock they tell of a student, who when he was informed that he was ready to solo, said to his instructor. "All right, you get in the back seat where there are no controls, and I'll see if I am."

Came the fateful day! After 45 minutes of good touch-and-goes, Bob told me to stop and let him out. He called the tower and told them I was making a first solo. The tower asked if I would use radio, to which Bob replied, "Yes, but limited." As Bob prepared to get out, I must have had a forlorn expression, for he reached in and pushed his seat as far forward as it would go. But even then the plane had a terribly empty feeling.

No one but another student could appreciate what I was experiencing now. I wanted to solo. I didn't want to solo. I couldn't think of a reason not to do so. I took off. I was afraid to hang the radio "mike" in its proper place; I wanted it where I wouldn't have to reach for it. I tried to hang it on the instrument panel and ended up gripping it between my knees. It was my one link with another human being. A first solo is a great loneliness. I prayed —right out loud! I wondered afterward if I might have had the mike button pushed down so that the tower received me.

When I called them for landing clearance, I was told I was third in the pattern and to extend my downwind leg. Happily, I made a good three-point landing. Bob was waiting for me on a little island between the runways. The tower said, "You really 'greased' that one on, but I thought sure you'd clip your instructor!" I had touched down farther along the runway than intended, so had to brake and turn into the taxi strip at a fairly fast clip. Bob later admitted he was looking for a "gopher" hole.



J. T. and the children were waiting. They never seemed more wonderful! After being congratulated we went home —on top of the world! I had exactly nine hours.

My first dual cross-country was to Hobbs, N. M., Midland, Tex., and back to Lubbock. My navigation was pretty good. Bob signed my Student Pilot Certificate, which qualified me to go solo cross-country.

I planned an easy trip along a well-defined railroad and highway to Snyder, Tex. Bob thought it better that I go some route a little harder to follow—Childress, Amarillo, and back to Lubbock. I charted my course, using a plotter. The Sectional Chart had been used before and had a course drawn to the Wilbarger County Airport. Somehow I got off on that course and was away down near Paducah when I saw my error. I wasn't lost; I knew where I was, but for one terrible moment I knew panic. I turned, found my way to (*Continued on page 90*)

The standard model, L-1, of the Royal Gull amphibian on the ramp at the General Mitchell Municipal Airport, Milwaukee, Wis.

FLYING CHECK PILOT

REPORT ON THE

Trecker Royal Gull

Designed and built in Genoa, Italy, this fast twin engine amphibian is now being assembled and sold in the United States.

By FRED J. BUNYAN

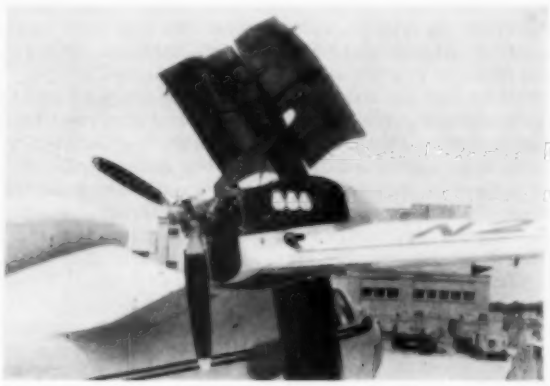
ALTHOUGH MY REGULAR employment is that of a jet test pilot, with various other assignments thrown in from time to time, I am decidedly a landlubber when it comes to seaplanes. Nevertheless, what pilot does not like to get a crack at a new ship. So when a chance to fly the Trecker Royal Gull P-136-L-1 amphibian came my way, I grabbed it.

This is an interesting airplane, rugged, beautifully designed, well-powered, excellent in single engine performance and easy to handle, even for me, on the water. I judge it will grow popular among those who have need for amphibious utility. It is apparently the only twin engine amphibian in its class now in the American market. In one respect it already has set a record. The Trecker Royal Gull is one of the first airplanes manufactured outside of the United States to be granted a CAA Approved Type Certificate of Airworthiness. A CAA inspection team travelled to the Piaggio plant in Genoa, Italy, to examine manufacturing techniques, design and construction features and service testing of the plane. The ship had already been approved by the Italian counterpart of our CAA, the Registro Aeronautico Italiano, and by the technicians of ICAO. And of course, it has been in operational service for more than three years with the Italian Air Force.

The plane first came to American attention when President Francis J. Trecker, of the Kearney & Trecker Corporation of Milwaukee, Wis., was travelling in Italy in 1954. Kearney & Trecker, old line manufacturers of tools for heavy industry, were branching into the aviation tool

The Royal Gull L-2 supercharged amphibian takes off with a one-ton cargo load (no wind) in 14 seconds. Note spray free windshield.

Preparing to cast the Gull's anchor in quiet waters. Pusher type props permit the amphibian to be taxied safely close to the stern of a yacht.



There is easy access to the 270 hp Lycoming engines on standard version of the Gull by swinging top cowl up and lower cowl down.

The Trecker Royal Gull is as much at home on an airport as on water. Note clean design and the uncluttered visibility afforded the pilot.

business. The company had been one of the first outfits to use corporate aircraft and Trecker became enthusiastic about the possibilities of the Gull in this respect. He made arrangements with Piaggio & Company to market the aircraft in the United States, Canada and Mexico; and the Royal Aircraft Corporation was set up as a subsidiary of K&T. Subsequently, the name of the company was changed to Trecker Aircraft Corporation.

The ship arrives in the United States in a single crate, 38 feet x 9 feet x 11 feet, minus engines, props, instruments and accessories. Trecker assembles the plane, installs the American-made parts and markets it. Some 75 engineering changes have been made to better adjust to North American requirements. The Trecker Corporation has the rights to manufacture the entire plane should any unforeseen contingency interrupt delivery from Piaggio. Present retail price is $74,500 less radio.

And now, before the data on my check flight, some details about the plane itself.

As the photographs show, it is a gull-wing, pusher design of metal construction. Empty weight is 4,400 pounds, and gross 6,000, giving a useful load of 1,600. Fuel capacity is 190 gallons, carried in two equal sized tanks in the center fuselage. Elevator, rudder, and ailerons are fabric covered. An aft baggage compartment on the left side of the fuselage measures 20 inches x 40 inches, and loads to 300 pounds, with another compartment loading 120 pounds immediately behind the rear seat, and accessible during flight. Both are easily loaded from land or water according to Wallace F. Watson, Chief Pilot for the company, who accompanied me on inspection and in flight. Watson spent four years as an amphibian pilot in Alaska, and this along with his other years of flying makes him an ideal evaluator of this aircraft.

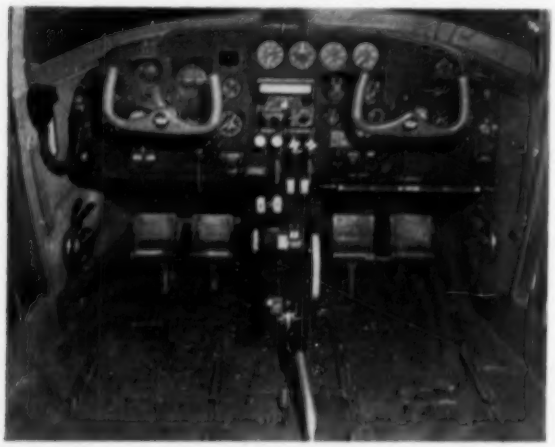
The instrument panel is fully equipped for instrument and night flying—well organized for convenience. Most of the circuit breaker type switches are mounted on the overhead panel, which also contains the control to extend and retract the water rudder.

The comfortable interior is notably styled by famous European standards and crafted by skilled Italian coach builders. Seats are adjustable and the roominess of the cockpit reduces fatigue on long flights. Landing gear control and flap lever are mounted on the center control pedestal, readily accessible to either pilot or co-pilot; and shaped as a miniature wheel and airfoil to prevent design induced pilot error. Heating is supplied by a 20,000 BTU Stewart Warner Southwind heater, and ventilation is well planned for summer operation. The ship is also equipped with an outside power connection.

The electrical system is 24 volt with two 33 amp hour capacity batteries, and two 50 amp hour generators. There is a single electric motor-driven hydraulic pump with a manual pump for emergency. Power is provided for the L-1 by two Lycoming 270 hp engines equipped with three blade Hartzell full-feathering, variable pitch, aluminum alloy, constant speed propellers. The Hartzells replace the original Italian propellers. The high gull wing mounting of the engines is conducive to cabin noise reduction, keeps the props clear of the water, and eliminates spray on

the windshield, even in rough seas. I like the Italian design that prevents water from entering the wheel bearings so that brakes are equally effective wet or dry and without chatter.

Starting is conventional. The engines require no manual leaning at altitude, this being taken care of automatically. Mixture controls are labeled "*Stop*" and are used only to shut down.



Cockpit of Royal Gull shows the functional positioning of instruments and controls. Throttles are on central pedestal rather than overhead.

Luxurious interior of the Royal Gull executed by Torino, the famous Italian sportscar body designer, as seen through the "yard wide" door.

One is conscious of the aircraft's weight upon advance of throttles to taxi. Visibility is not as good for ground operation as light twins with nose wheels. The full swivel tailwheel can be locked for long straight taxiing and take-offs. Ground riding characteristics are good.

Our take-off roll with 100 gallons of fuel was 800 feet with half-flaps. Power was 27 inches mp and 3,400 rpm. After gear was retracted, climb out was made at 25 inches mp and 2,850 rpm at 120 mph, well above the required single engine climb-out speed of 95 mph.

After reaching altitude, stalls were performed in both clean and gear-and-flaps-down configurations. Clean stalling speed was about 75 mph and with gear and flaps down approximately 68. No undesirable characteristics were noted. It would be difficult to accidentally stall this plane because of the heavy elevator control pressure required.

Next we chopped the right engine and feathered the propeller, a simple procedure similar to that of most light twins. The right throttle was retarded and the mixture control placed in the "*Stop*" position. Next, the right propeller control was brought back to the feather position. A safety feature before the prop control can be placed in feather position, it is necessary to lift a safety lock. I liked this feature very much. It will prevent accidental feathering of either prop.

After feathering, engine control pressures were trimmed out. The Gull is equipped with rudder and elevator trim tabs, but no aileron trim. An aileron trim would be appreciated by pilots.

Satisfactory turns can be made into either the live or dead engine. With a full throttle power setting and 3,000 rpm on the single engine we maintained an indicated rate of climb of 300 fpm at 100 mph. Unfeathering procedure simply repeats ground starting plus moving the propeller control out of feather position.

Weather was unsatisfactory for a complete evaluation, due to 3,000 feet overcast and rain. At 2,000 feet, maintaining 70 per cent power (22 inches mp and 2,750 rpm), indicated airspeed was 146 rpm with outside air temperature 15°C.

This landlubber was highly impressed with the Trecker Gull's water handling characteristics. I was advised that, unlike most amphibians and flying boats, the Gull can be landed nose low or a full stall landing can be made. The sea rudder gives remarkable directional control on the water. This together with differential throttle enables handling the ship with the ease of a motorboat. The right windshield opens which is a big help in beaching or docking. The company appears conservative with their 18 seconds water take-off time.

American-made, salt resistant, aircraft paints are used on the Royal Gull, but it is always wise to wash an airplane following salt water operation.

Entering the traffic pattern, it is easy to check the gear position. In addition to a green light there is a mechanical gear position indicator. When the flap handle is actuated, the flaps move at the same rate of speed as the flap handle. Most pilots will appreciate this factor. Landing proved conventional, touchdown speed slightly under 70 mph.

Engineering changes by Trecker will be approved by both mechanics and pilots. One is removal from the cockpit of the hydraulic tank and (*Continued on page* 85)

SPECIFICATIONS OF THE TRECKER ROYAL GULL

Standard Model P136-L-1

Engines	2 Lycoming 6-cyl. GO-480 B1B's
HP and RPM	260 @ 3,000 MSL 270 @ 3,400 for take-off
Gross Weight	6,000 lbs.
Empty Weight	4,400 lbs.
Wing Span	44 ft. 4½ in.
Wing Loading at gross wt.	22.22 lbs/sq. ft.
Power Loading at gross wt. (6,000 lbs.)	11.54 lb/hp
Baggage capacity	420 lbs.
Fuel capacity	190 gals.
Cruising Speed (at 70% power) 2750 rpm, 21.3" Hg at 5,000 ft. (at 65% power) 2750 rpm, 20.8" Hg at 8,000 ft.	 161 mph 164 mph
Stalling Speed (flaps and gear retracted)	75 mph
Stalling Speed (landing with flaps)	68 mph

INTRODUCTION:

In this month of August, 1957, the 50th anniversary year of U. S. military aviation, FLYING *presents a biographical sketch based on the reminiscences of Brig. Gen. Frank Purdy Lahm (USAF Ret.), not because General Lahm is the dean of military pilots but because both in civil and military aviation his stature among the pioneers is the heritage alike of all who thread the sky in peace or war.*

The scion of a notable American family, and himself a distinguished young cavalry officer when the airplane came into vogue, Lahm was one of the few of his day who foresaw its potential—who understood that, regardless of crude beginnings, a revolutionary mobility had been introduced into human affairs to vastly affect all nations and peoples in the matters of security and trade. This was an intellectual achievement of high order and did much to shape the course of American and world history. And although dealing with a revolutionary subject, Lahm had an infinite patience and understanding of how tenaciously the human mind clings to the past. This patience was a balance wheel in the convulsions of the years surrounding early aviation.

Although he was a professional soldier for 45 years, Lahm was likewise eagerly active in civil aviation. The least experienced private pilot had his ear as readily as the top military ace. He was a tower of strength to the National Aeronautic Association when that organization embraced the whole of civilian endeavor. His wise mind refused to be trapped in the divisive influences which have preyed on aviation. His concept of airpower was embracive of all effort to realize the greatest national advantage from flight—an example we could well take to heart even today.

Perhaps even above and beyond Lahm's concept of and participation in aviation, has been the patriotic motivation he has transmitted to the thousands of young men privileged to come under his influence. His skill as an airman and his enthusiasm for flying never outran his deeper devotions to God and country. Those of us who served under his stern command never felt the burden of his discipline to be other than the requisite way to the country's objective. He impressed, not with his authority of rank, but with his dedication to the privilege of duty.

By dint of long persuasion, the Air Force Historical Foundation got General Lahm, with the help and encouragement of his long-time dear friend, author Fred C. Kelly, to set down a biographical sketch. Kelly is the eminent biographer of the Wright brothers. A dozen biographies could be written of Lahm from different viewpoints—aviation pioneer, big game hunter, expert horseman, world traveller, military analyst, educator, linguist, etc. . . , we here choose excerpts principally on Lahm in his aviation activities and can think of no more fitting way to take part in the celebration of the 50th anniversary of military flying. Although this sketch is written in the third person, it is, as Kelly says, Lahm's story.

GILL ROBB WILSON

Brig. Gen. Frank Purdy Lahm, USAF, (Ret.)

The Memories of a Pioneer

The authentic story of a great American airman active in military and civil aviation for forty-five years.

Illustrations by Joseph Forte

THE HOLDER of Airplane Pilot License No. 2, Airship Pilot License No. 2 and Balloon Pilot License No. 4; and the first officer in the U. S. military service ever aloft in an aircraft, was born in Mansfield, Ohio, November 17, 1877, to Adelaide Purdy Lahm and Frank Samuel Lahm.

His mother, dying in 1880, and his father living in France for health reasons, the boy was raised in the Ohio countryside by his foster mother, a widowed aunt, Mary Purdy Weldon, of sterling Christian character.

Four distinct influences seem to have shaped the early years of the boy. The first was his aunt. Inspiration for West Point and an Army career came from his uncle, Maj. Joseph Hedges, holder of the Congressional Medal of Honor for leading the Fourth U. S. Cavalry in a historic charge during the Civil War. Additional was a cousin in Michigan Military Academy who turned Frank toward that school at Orchard Lake. A fourth was another cousin from Amherst who planted a love of competitive sports in the young Lahm.

By the time he was 16, Frank was a notable athlete,

having captained both the football and baseball teams in high school and organized the "Sherman Zouaves," named for Senator John Sherman of Mansfield and his famous brother, Gen. Tecumseh Sherman. The Zouaves were a showy outfit, marching in Memorial Day parades and kindred functions and incidentally absorbing a vast amount of patriotic lore and military skills from the veterans.

At this age, Frank's father took him to France and placed him in a Dominican School, Albert-le-Grand, presided over by the brilliant educator, Father Didon. The eminent cleric was also a devoted sports fan and Frank duplicated in France the outdoor life he had lived in Ohio, except that now it was Rugby, cross-country running, mountain climbing and gymnastics.

Returning to Ohio in 1895, the boy entered Michigan Military Academy, was a leading athlete, Lieutenant of the Corps and valedictorian of his class. In two years he was ready for West Point, and entered there in June.

Graduating in 1901, scholastically twenty-third in his class, he had yet found time to quarterback the football team, captain the baseball team, set various gymnastic records, become an expert horseman, and serve as Lieutenant of the Company during his final year—commanding the Company when its Captain was disabled by an accident.

Assigned by request to the Sixth Cavalry in China, where that outfit had served during the Boxer Rebellion of the previous year, 2nd Lieutenant Lahm en route arrived in Manila to see William Howard Taft inaugurated as first Governor General of the Philippines; and then on to the Sixth Cavalry, which meantime had moved to the Philippines. For the next several years, Lieutenant Lahm campaigned in quelling rebellion in Luzon.

Lahm detoured via China, Korea and Japan en route home to San Francisco with the Sixth for anticipated service in the Dakotas and Montana.

But here the course of his career was inadvertently changed. Lahm, to his bitter disappointment, was ordered to West Point as an instructor in modern languages. Summer leaves were spent touring Europe. In Paris he was introduced to the art of aerostatics. His father had joined the Aero Club of France, owned and flew his own balloon, and indoctrinated Frank to the art.

After three years at the Point, with Katherine, his sister, as housekeeper, Lieutenant Lahm applied for relief of duty and assignment to the illustrious French Cavalry School at Saumur, France. Waiting in Paris for October opening of the Saumur school year, Lahm perfected his balloon piloting techniques. He had received his pilot license from the Aero Club of America—No. 4 in the summer of 1905.

Two important events took place shortly after this. James Gordon Bennett, publisher of the New York Herald, established a trophy in the hands of the Aero Club of France with a request that the club write regulations and stage the first International Race for distance, open to any type of aircraft. Balloons were the only practical vehicles. Each national club was invited to enter three balloons. Mr. Lahm, Sr., was designated to represent the Aero Club of America, together with Santos Dumont of Brazil, whose country was not then represented in the Federation. However, Lahm, Sr., was called home to attend his daughter's wedding and left his son to handle his duties in the Federation.

Sixteen balloons were entered, representing the United States, France, England, Belgium, Switzerland, Italy and Spain. Each balloon carried a pilot and aide. Lahm had invited his friend the famous French balloonist, Levee, to be his aide. The latter had accepted but, under pressure from the French Aero Club, withdrew just before the start. Fortunately, a substitute was available. Maj. Henry B. Hersey of Roosevelt's Rough Riders of 1898, and a member of the U. S. Weather Bureau, had arrived in Paris from Spitsbergen after the second unsuccess-

ful attempt by the Walter Wellman expedition to reach the North Pole in an airship. Hersey accepted the invitation and asked only time enough to go to his hotel and pick up his overcoat.

The contestants rose from the Tuileries Gardens in Paris on 30 September, 1906. Lahm's balloon, 12th to take off, ascended at 4:55 p.m. and headed south of west. This was not auspicious, as the Atlantic Ocean would limit the distance of westward travel. Gradually the wind shifted, and when the balloon crossed the Channel Coast at 11:17 p.m., it was coursing toward the southwest tip of England. Due to possibility of the balloon drifting to sea, the emptied sand ballast bags were made into "cone anchors" with cord brought along for this purpose. If necessary, these cones could be dragged behind the balloon to slow it down. However, the wind shifted to the south and the balloon headed directly at the North Star. The pilot and his aide could relax. At 3:30 a.m., they crossed the English Coast to the east of Chichester. Here morning fog set in, and it was not until after 7:00 a.m., that it cleared enough for the flyers to call down to farmers and learn they were over Bucks County. They continued to travel north over Stratford-on-Avon and Warwick Castle, keeping the balloon low, because higher air currents were strong toward the North Sea.

At 2:00 p.m., they began to decrease altitude from 10,000 feet, hoping to reach Scotland that night. Suddenly the coast loomed in the mist. They released gas, and the balloon descended rapidly over the desolate moors, miles from any habitation. By alternately valving gas and throwing out sand ballast, they managed to cross the moors and landed near Fyling Dales in Yorkshire, not far from Whitby Castle and Robin Hood Bay. A kindly English squire, recovering from his astonishment at sight of the great bag stretched out in his pasture, signed their landing certificate, provided transportation for the balloon and its passengers to the nearest railway station, and lent them English money for the return to Paris. Prior to departing, the flyers had provided themselves only with European currency, expecting to make their flight east, rather than west of Paris.

The next afternoon in London, Lahm and Hersey learned they had won the race. It was a great international triumph for the United States.

Lahm now reported to the Cavalry School at Saumur. This school had been founded by Napoleon in 1802 and had the reputation of being the finest of its kind in the world. In its stables were 1,800 horses—thoroughbreds, Anglo-Arabs, half-breeds, trained jumpers, green colts, and perfected high school horses. The curriculum consisted of varied cross-country rides, staff drills and daily classroom sessions. Saumur is in the hunting country and student officers were permitted to accept a limited number of invitations to follow the hounds with different "equipages" in the Loire Valley. To Lahm it was a wonderful experience to follow the deer or wild boar.

The winter climate of the Loire Valley is damp and cold. School work is strenuous. Toward spring Lahm contracted typhoid fever and, after 13 weeks in military hospital, spent a long convalescence in his father's apartment in Paris and later in a rest home in St. Germain.

It was during this convalescence that one day the garden gate opened and in walked Lahm, Sr., accompanied by Orville and Wilbur Wright. That was the beginning of a close friendship which lasted until both Wright brothers had died. Because of their inspiration, aviation became of great concern to Lahm.

Immediately thereafter, another happy assignment came to him. After a few weeks in the Swiss Alps, he received orders in August from the War Department detailing him to duty in the newly created Aeronautical Division of the Office of the Chief Signal Officer. This was the organization which was to become the United States Air Force of today. Later orders detailed Lahm to duty in England and Germany to investigate military aeronautics. In London he was the guest of Griffith Brewer, a participant in the Gordon Bennett Races of the year before; later one of the Wrights' pilots. While in London, Lahm made a balloon flight with another future Wright pilot, Charles Rolls, who later lost his life flying a Wright plane in London in 1910.

Both English and German authorities were cordial in their reception of the American lieutenant; the Germans were a little reserved in showing what was considered "classified information." Lahm went to Friedrichshafen in hope of seeing the Zeppelin airstrip, but was unsuccessful. At a reception given by Ambassador Charlemagne Towers in Berlin, Lahm met numerous prominent persons, among them President Handley of Yale and William Howard Taft who was returning from a visit to the Philippines. Taft expressed only mild interest in aviation, especially as far as he personally was concerned. Little did he realize then that he was later to have a prominent part in the War Department's acquisition of its first airplane.

Upon return to the United States late in 1907, Lahm made a report to the Chief Signal Officer covering information acquired in Europe. This report was delivered in person by General Allen, Captain Chandler, and Lieutenant Lahm to President Theodore Roosevelt to back up their requests for funds for aeronautics. The request

received favorable consideration from the President.

Before leaving France, Lahm had his first airship experience in the "Ville de Paris." The engineer was Louis Paulhan, later prominent as an airplane pilot and participant in the 1910 aviation meet at Dominguez Field.

Lahm spent 1908 and 1909 in Washington, years filled with epic significance to the future of military aviation. During the winter he answered a flood of letters from inventors who had been spurred on by the success of the Wright brothers. Most of these letters sought financial assistance from the government to sponsor some project or idea designed to solve all the problems of flying. No such assistance was forthcoming. During this period also, free balloon ascensions were made testing radio equipment and the use of carrier pigeons. At nearby Fort Myer, with a detachment of Signal Corps soldiers, Lahm practiced captive observation balloon work with hydrogen generated from sulphuric acid and water in a portable generating plant.

Alexander Graham Bell, the inventor of the telephone and a close friend of the Smithsonian's Professor Langley, became an early aviation enthusiast. Lahm was invited to Bell's Wednesday evening soirées in his Washington home where invited scientists gave talks on a variety of subjects. During one of these soirées, Lahm was persuaded to speak of his Gordon Bennett Race adventures.

Dr. Bell had his own theories for Conquest of the Air. As president of the Aerial Experiment Association, he fostered research with tetrahedral kites at his summer home in Baddeck, Nova Scotia. Lieutenant Selfridge, Secretary of the Association at the time, ascended in one of the kites to a height of 168 feet and remained in the air for seven minutes.

In February 1908, the Signal Corps contracted with Capt. Tom Baldwin for its first airship, to have a speed of 20 mph and be capable of remaining in the air for two hours. This contract was completed at Fort Myer in July; Captain Baldwin was the pilot and Glenn Curtiss operated the engine, one of his own invention. Lieutenants Lahm, Foulois and Selfridge were taught to fly the airship. Later they made exhibition flights at St. Joseph, Mo., Omaha, Neb., and Des Moines, Iowa; together with Sergeant Ward and three pupils, Lieutenants Raymond Bamberger, Oliver Dickinson, and John G. Winter.

In 1907, Lahm, Sr., had organized the Aero Club of Ohio in his native town of Canton and piloted its balloon, "The Ohio," on the first of many ascensions over a period of years. Lahm, Jr., came from Washington to pilot two ascensions carrying passengers.

For three years, after their first successful flights in 1903 the Wrights tried unsuccessfully to interest the War Department in their flying machine. Finally a letter in their behalf was addressed by members of the Aero Club of America to President Theodore Roosevelt, passed on to Secretary of War William Taft, and by him to the Board of Ordnance and Fortifications. The Board was forced to act. They wrote the Wrights, telling them they were interested in the offer presented, but that no funds were available, and that Congressional action was required. At this time Lieutenant Lahm wrote a letter from France to the Chief Signal Officer, General Allen, expressing confidence in the Wrights and a belief that their invention would be of use to the Army.

In December 1907, Wilbur Wright met the Board and created such a favorable impression by his unassuming manner and modest claims that soon specifications were drawn up by the Signal Corps for a heavier-than-air machine, based on the performance the Wrights stated could be met by their invention. This airplane was to have a speed of 40 mph., fly one hour carrying two persons, have a fuel capacity for 125 miles, and also have means for safe descent in the event of engine failure. The Signal Corps was not then familiar with a "dead stick" landing!

August 1908 marked another milestone in American aeronautics. Orville Wright came to Fort Myer with the first airplane produced for military use. After several tuning-up flights, on September 9, he established a world record by remaining aloft more than an hour. After landing he invited Lieutenant Lahm to go up for his first flight. The sortie lasted six minutes and 40 seconds, and was a record at the time for two persons.

Eight days later Orville Wright took Lieutenant Selfridge aloft. A split propeller blade and a broken wire connection to the vertical rudder caused the crash in which Selfridge was killed—the first person to lose his life in an airplane accident. He was buried in Arlington Cemetery across the wall from the flying field. His family erected a monument over the grave and his friends placed a tablet in the cemetery at West Point where he had graduated five years before.

In June 1909, Lahm accompanied General Allen to Dayton for a two-day celebration honoring the Wrights, and to present them with a Congressional Medal.

In that same month the Wrights went to Fort Myer with a better and faster plane. Orville accomplished the terms of the contract by flying more than one hour, with Lieutenant Lahm as a passenger, and this re-established the world record. Later, with Lieutenant Foulois as passenger, Orville flew at a speed of more than 42 mph over a measured five-mile course to Alexandria. In addition, the Wrights had to meet the requirements of teaching two officers to fly. Since the field at Fort Myer was considered too small for training, the Signal Corps rented a field at College Park, Md. In October of that same year, Lieutenant Lahm and Lt. F. E. Humphreys of the Engineers made solo flights after about three hours of dual instruction under Wilbur Wright. A few days later this Lieutenant Lahm carried Lt. George Sweet as a passenger, to achieve the distinction of being the first Naval Officer to ride in an aircraft.

Lt. Frank P. Lahm and Maj. Henry B. Hersey in Gordon Bennett Cup Race, Sept. 30, 1906.

On March 4, 1909, William Howard Taft succeeded Theodore Roosevelt as President of the United States. Lahm was in the saddle for ten hours as an aide to the Chief Marshal of the inauguration parade, J. Franklin Bell, and received a certificate of appreciation for arranging the wire lines along the line of march.

Lahm now reported to the Seventh Cavalry at Fort Riley, Kan., and Humphreys returned to the Engineers because Signal Corps funds for aviation were exhausted. However, before joining his Regiment, Lahm went with his father to spend the holidays at Camp Columbia, Cuba, where Captain Parker had established a Cavalry School for the Cuban Government. From there both Lahms went on a sight-seeing tour of Jamaica and the Panama Canal. Here they visited with Capt. R. E. Wood and viewed the construction of the Canal. They were entertained by General Goethals, Chief Engineer, who had been Lahm's instructor in Practical Military Engineering at West Point. Lahm, Jr., then joined the Seventh Cavalry at Fort Riley where he spent a year and a half. In September, he left the Regiment to enter the Mounted Service School as a student. In November, as a member of the Cavalry Riding team, he rode the Military Steeplechase at Belmont Park, Long Island, and was a contestant in the broad jump at the Madison Square Garden Horse Show. He graduated in June 1911.

The first "roadable" airplane was an Army biplane at Fort Myer, Va., in 1908.

During July of that year he also competed in the National Balloon Race from Kansas City, with Lieutenant Hart of the National Guard, as aide. During the race, they rose to a height of 22,000 feet over Indiana, but were unable to continue without oxygen, and made a hasty descent to land near La Paz, Ind., and win first place in the competition. This race qualified Lahm as a contestant in the Gordon Bennett International Race from Kansas City in October. His aide was Jeff Wade from Cleveland. The strategy in every long-distance race in the United States was to reach the Great Lakes, then follow the St. Lawrence River. A southwest wind was blowing when they made their late start in the afternoon.

Shortly after midnight, the pilots encountered a violent storm. The balloon was driven down by the weight of the water and the instruments, as well as the aeronauts, were soaked as the deluge poured into the basket. The wind then changed their course from northeast to north, and soon to northwest, which meant that the distance from the starting point was being diminished. This called for a decision. Lahm spotted a clearing in the dark and opened the valve, allowing the balloon to land. The crew had no idea where they were, but managed to rouse a farmer at 3:30 a.m., and learn they were near Cataract, Wis. Washed-out bridges delayed their arrival at a railroad station until next morning where they learned that a German pilot, Lt. Hans Gericke, had landed 63 miles farther north from Kansas City, so they had to be content with second place.

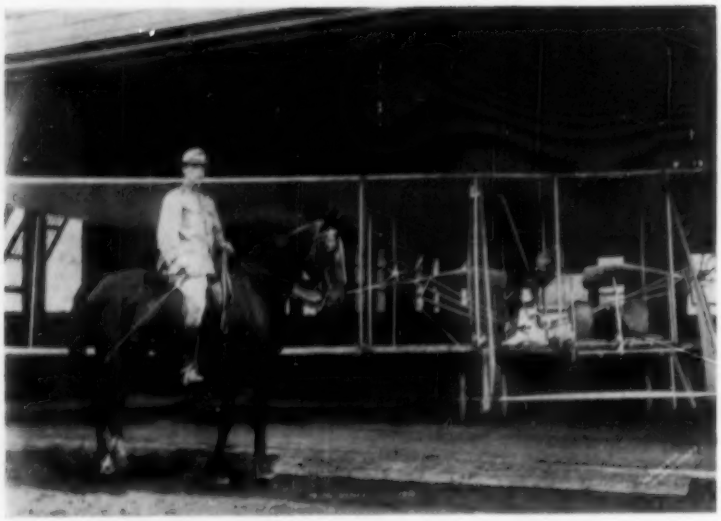
Following this interlude, Lahm spent some time in Dayton at the home of the Wright family. Here he was made poignantly aware of Americanism in action as he observed and studied the members of the family—congenial, solicitous, intelligent and self-reliant, working together as a family, doing the kind of things that have made America what it is today. Also while here, Orville Wright gave Lahm instruction on an airplane equipped with wheels rather than skids. This instruction was later to prove valuable when Lahm was detailed to fly a Wright airplane in the Philippines.

On October 18 of that year, Lahm married Gertrude Jenner, a life-long friend, of Mansfield, Ohio. They left by Army transport for the Philippines where Lahm once again joined the Seventh Cavalry. He spent three years at Fort William McKinley near Manila. The Moros were still hostile, and for travel, an armed escort was necessary. Double sentries called the hours through the night at Camp Keithley in Jolo. The Cavalry stables there were surrounded by barbed wire to prevent the Moros from stealing in during the night with their deadly krises and bolos.

It has been interesting for Lahm to look back on the Army maneuvers of 1911-1914. These were based on the identical plans outlined in "Valor of Ignorance," a remarkable book published in 1909 by a little hunchback Californian, Homer Lee. Lee had served as a General in the Chinese Army and was thoroughly familiar with the political, economic and military situation in the Far East. The strategy which he outlined in his book was followed by the Japanese when they took the Islands in 1942, and by General MacArthur when he retook them in 1945. However, between 1914 and 1942, conditions had changed materially. The 1914 plan did not take into account the treaty of 1921 by which the U. S. reduced Naval strength while the Japanese continued to increase theirs. Nor did we have bombing planes in 1914. (Then too, came the catastrophe of Pearl Harbor which crippled U. S. Naval strength in the Pacific.) Lee's plan provided for a slow retreat from Lingayen Gulf, delaying action to the southeast of Manila, a short stand on Bataan Peninsula, and finally concentration on Corregidor Island to await a relief expedition from the United States.

The changes noted above precluded any chance of relief and our garrison never had a chance.

Lieutenant Lahm was given responsibility for initiating military aviation in the Philippines. A Wright type "B" was sent to the Signal Corps early in 1912. In March



Brig. Gen. Frank P. Lahm (Ret.) when he was a Lieutenant with the Seventh Cavalry at Fort McKinley, poses with the first Army airplane in the Philippines, a Wright type "B".

after the annual Army maneuvers, Lahm was detailed on temporary duty from his Regiment to the Signal Corps. He was aided in his initial efforts by two experienced soldiers from the United States and soldiers from the Signal Corps in Manila, whose records indicated that they had had some mechanical experience.

A hangar was erected at the end of the polo field at Fort William McKinley; the plane was assembled and the flying started. Lt. Moss Love, on duty with a Signal Corps Company, was given permission by his Commanding Officer to take flying training in off-duty hours. Another volunteer for flight instruction was Sgt. Vernon L. Burge, who had been with Lahm at Fort Myer and College Park in 1908 and 1909. Both of these men qualified as pilots and were the first to do so in the Philippines. Burge, in addition, was the first enlisted man to earn that rating. Love was later killed in a Wright type "E" in the States, and Burge eventually retired as a Lieutenant Colonel of the USAF.

On one occasion when Lieutenant Lahm was flying in the Philippines, the plane spiraled in from a height of 150 feet, landing in the soft mud of the Taguig River beside the field. He emerged with only a severe shaking up.

During the long transition period when flying was trying to gain recognition in the military establishment, aviators and flying machines were all looked upon with disfavor by the Army. One day, Lahm landed his plane on the parade ground in front of the quarters occupied by the Colonel commanding the Seventh Cavalry, with a view of paying his respects to the Commanding Officer. He did not even get in the front door.

When the rainy season came, the plane was raised on supports, because the rains brought three feet of water in the hangar. During this time, Lieutenant Lahm went back to regimental duty. When flying was resumed next year, three officers were officially detailed to flying training. They were Lieutenants Dargue, Chapman and Rich.

When the rains came again, Lahm flew the Wright type "B" to the beach at Pasay, on Manila Bay, and substituted pontoons for wheels. Training continued from a temporary suali hangar on the grounds of the Manila Polo Club. The "B," however, was cracked up by one of the students, and pontoons were fitted to a Wright "C" which had arrived from the States. At the first trial flight, it refused to rise from the water. The next day, Lieutenant Lahm tried it again. This time, after a run of about three-quarters of a mile, it did take off but promptly dove in from a height of ten feet at about 50 mph. Lahm found himself under water, entangled in the wires. He managed to kick loose, rose to the surface because of his kapok jacket, and was rescued by the crash boat, a four-oared rowboat, manned by his students. The plane was demolished. A second type "C" was equipped with pontoons and two students were checked out in it.

Lieutenant Rich, the third student, of the Philippine Scouts, was a little slower in assimilating the necessary skill. One day, gliding in for a landing, his plane plunged headfirst into the water, killing the pilot. Type "C" was abandoned by the Signal Corps after several others also lost their lives in it. It was pronounced aerodynamically unsuitable.

In May 1913, Lahm was able to repay his father for the balloon ascension of 1904. The elder Lahm stopped off in the Philippines for several weeks during a round-the-world tour. The son had the satisfaction of taking him for a ride in the Wright airplane.

As the three-year tour was ending, the Lahms took advantage of a 30-day leave and toured Japan over the same route which Frank had traveled in 1903. Lahm rejoined the Regiment at Nagasaki. When they arrived at San Francisco, he found orders assigning him back to his original outfit, the Sixth Cavalry, then at Texas City, Tex. The Texas City era ended when the camp was washed away by the flood of 1915. Regimental headquarters were moved to Harlingen and the troops scattered along the Rio Grande to keep out raiding Mexicans. Lahm's Troop "A" was subjected to many alarms, but never attacked.

In the spring of 1916 Lahm was offered the post of Secretary of the Signal Corps Flying School at North Island near San Diego, Calif. He accepted and reported to the new Commandant, Colonel Glassford.

In general, flying training was routine although the pace accelerated with each passing month. One incident on January 10, 1917, served to interrupt. One of the instructors, a husky young pilot, Lieutenant Robertson, took off one day on an unauthorized flight for Yuma, Ariz., with a friend, Lt. Col. Harry Bishop of the Field Artillery. Dead reckoning skills had not yet been developed to a very high degree. An undetected drift took the plane across the Mexican border. It ran out of gas and the men landed on the shore of the Gulf of California, which they mistook for the Salton Sea. In a short time, high tide revealed their error, so they set out in search of the Southern Pacific Railroad in Arizona.

During the first four days in the desert they applied survival principles by stretching their two oranges and two sandwiches apiece. However, they exhausted the five gallons of water which they had drained from the radiator of the plane, and were forced to suck moisture from the cactus leaves. This kept them going for four more days but thereafter, the older man, Bishop, gave out. In the meantime a report reached North Island on the position of the downed plane. Lieutenant Lahm set up a searching party, over some objections of the Mexican government, since the party wanted to base their operations in Mexican territory, across from Mexicali. Lieutenant Lahm took a truck train across

the mountains and established the base from which the searching airplanes were to operate, 28 miles south of the border. Governor Rodriguez of the State of Lower California, came and offered full assistance.

Another search party directed by John Greenway, a mining engineer, was started from Ajo, Ariz., at the request of Colonel Wilder, of the Eleventh Cavalry, in charge of the border patrol at Calexico. This party found Robertson two days after Bishop collapsed. The pilot was back on flying duty within a few days but Bishop did not return to duty until six months later, after losing several gangrene-infected toes.

By 1916 it was evident that the United States would be drawn into World War I. Army Lieutenants began arriving in larger numbers at the flying school to take up training. Even then, it was apparent to many of them that air operation was destined to play a large role in future military activities. Among the officers enrolling for training were many who later became famous—Spaatz, the Harmon brothers, Johnson, Brett, Cousins, Davison, Heard, A. D. Smith, and a supply officer by the name of Capt. Henry H. Arnold.

Capt. Charles deF. Chandler meantime had organized, built and commanded the Signal Corps Balloon School at Fort Omaha, Neb. He was now ordered to Washington to head the Lighter-Than-Air Service, and Lahm was appointed to succeed him at Fort Omaha. Not long after taking command of the Fort, one of Lahm's polo ponies fell on him, causing a badly broken leg. Lahm's former aide in the 1906 Gordon Bennett Balloon Race, Colonel Hersey, took over command.

When Lahm was about to start on sick leave in July of that year he received a wire from Washington giving him the choice of a sick leave or a six weeks inspection tour of activities in France and England. It took him only minutes to wire back his choice. On August 11th, 1917 he sailed from New York on the troopship USS "Baltic." It was a long voyage in a large convoy, zigzagging across the Atlantic to Liverpool. The night before landing, the troops received a thrill. At about 7:00 p.m. the ship shuddered with a metallic thud. Passengers scurried to their appointed places at lifeboat stations. Because of previous drill preparations there was no confusion as the ship headed for the coast of Wales. After remaining at his station for 30 minutes, Lahm went forward and was told by the First Officer that the "Baltic" had apparently been struck by a torpedo, but that no apparent damage was sustained, and they would proceed on course.

It was Lahm's responsibility in England to inspect aircraft factories, depots, and training establishments. From Lympne he was flown across the Channel in a Bristol fighter, powered by a 250 hp Rolls Royce engine. Although aviation was born in America, other nations of the world were quick to wrest from us leadership in military development. This flight was, as a matter of fact, the first time Lahm had flown in a plane powered by more than 90 horsepower. It gave him a tremendous thrill, as he remembers it, to climb 1,000 feet in no time flat, by comparative standards with what he had been used to.

In France he reported to General Trenchard at British Headquarters, was assigned to Balloon headquarters of the Second British Army, and given every opportunity to see the war firsthand from air and ground. His introduction was realistic. During the great Ypres drive in September 1917, he was stalled aloft in an observation balloon by a balky winch motor and survived a night raid by Gotha bombers.

Later he reported to U. S. Air Service Headquarters in Paris and was then sent to the Sixth French Army near Soissons to observe a major offensive in that sector. Here at 3,000 feet, in an observation balloon, he was subjected to shelling by the Germans with their new time fuses.

After three months at Paris Headquarters of the U. S. Air Service and two months at General Pershing's Advanced Headquarters at Chaumont, Lahm reported to General Foulois at Colombey-les-Belles in the American Sector of Eastern France, Headquarters of the Air Service, Zone of the Advance. When Foulois took over command of the Air Service of the First Army from Colonel Mitchell, Headquarters moved to Toul. Frequent visits to air units operating under both French and American commands added much to a knowledge already acquired on British and French fronts.

When First Army Headquarters had been organized at La Ferte-sous-Jouarre, Lahm was detailed as Air Service representative in the G-3 Section of the Staff. By early August the First Army had fought the Battle of Chateau Thierry, moved its headquarters to Neuf Chateau and eventually to Souilly near Verdun. During this period plans were completed for the American battle of Saint Mihiel, which was fought and won September 12-15, and plans were made for the final offensive of the Meuse-Argonne to open September 26th. On one

Lahm (center, front row) organized and commanded the Air Service of the Second American Army at Toul, France, Oct. 1918.

of the critical days, Lahm flew as observer for General Mitchell on a reconnaissance survey of the entire front lines, from General Gouraud's Fourth French Army in front of Châlons to the right of the American line on the Meuse. A wealth of valuable information on enemy activity was obtained and reported to Army Headquarters, some of which, incidentally, the Artillery Staff refused to believe until it was confirmed by ground units which came under attack. All the knowledge acquired was to serve Lahm in good stead when he reported to Gen. Robert L. Bullard in Toul on October 14th, to organize and command the Air Service of the Second American Army.

Plans were completed for an American offensive to start on November 10th, but by this date it was quite evident that an Armistice was about to be signed. When the Armistice came on November 11th, 1918, the Second Army Air Service had grown to 19 aero squadrons (three attached from the French); six observation balloon companies (two attached from the French); five photographic sections, with the necessary supporting Park and Construction Companies. Observation, bombing, strafing, propaganda and pursuit missions, added up to 1,324 sorties. Ten German planes and one balloon were officially confirmed as shot down. Losses had been limited to one man killed and five wounded.

After the war came the let-down. Transformation of the Army from a fighting force to one at peace, was slow and methodical. No longer was it necessary to dim the lights at night, or to go armed at all times; no longer was there the exhilaration of war to keep the soldiers on their toes. It became necessary to provide occupation for battle-tired troops by organizing athletic leagues, theatrical troops, and rigid training programs. Some soldiers were allowed to attend the French schools and universities. As was inevitable, the Second Army Air Service gradually shrank as units were ordered home, or to the Third Army on the Rhine.

In June, Lahm himself prepared to depart for home. When he arrived in Paris, ready to sail, Col. Henry Richmond requested that he take charge of the Old Fort de Champigny near Paris, and play "host" to riding teams from Roumania, Italy, Belgium, Portugal and Arabia, who came to take part in the International games in the newly constructed Pershing stadium. At the home of General Pershing in Paris on June 21st, Colonel Lahm was one of seven American officers who received the Distinguished Service Medal. The French Government likewise decorated him with the medal of "Officer of the Legion of Honor." On 30 July he finally did head for home aboard the "Leviathan." He had spent nearly two years as a participant in the war theatre—and all because a polo pony broke his rider's leg.

Lahm spent the following year as a special student at the General Staff College in Washington. At that time, wartime Major Generals reverted to their permanent ranks of Lieutenant Colonel. Lahm exchanged his Colonel's "Eagles" for his permanent Captain's bars. The faculty of the College was composed largely of wartime staff officers. Many of the students had been corps, division, or brigade commanders. Significantly, the name was changed from General Staff College to War College. This assignment was followed by one of the Organization Branch of the G-3 Division of the War Department General Staff. The year before, Lahm had been named on the General Staff Eligible List. At his new assignment his time was taken up with the task of coordinating a new set of tables or organization for the Army, based on wartime experience. During this tour, he served as chairman of the Contest Committee of the National Aeronautic Association. When Lahm left Washington in 1924, Orville Wright succeeded him in the latter position.

The 1921 National Balloon Race was held in Birmingham, Ala. There were nine contestants, including U. S. Army Balloon No. 1, with Lt. Col. Lahm as pilot and Maj. Oscar Westover as aide. In the light of a full moon, they lifted from the ground at 8:42 p.m. and headed northwest. All night they held the balloon close to the ground, anticipating a later trend to the north with the hope of reaching the Great Lakes and the St. Lawrence River. A light wind however, upset this plan; consequently, at 1:00 p.m. the next day they were becalmed at 15,000 feet over Tennessee. They gradually lowered the balloon and were almost to the ground, when a violent rainstorm caught them and drove the balloon into some trees—and the flight was finished. Lahm's cousin, Ralph Upson, held his balloon a little higher throughout the night, thereby escaping the storm, and won the race after landing in West Virginia, 423 miles from Birmingham.

Lahm welcomed a detail as Air Officer of the Ninth Corps Area, with duty station at the Presidio in San Francisco. His duties required that he make frequent flights to inspect National Guard and Reserve Air units from Spokane, in the north, to San Diego in the south, and Salt Lake City in the east. His interest in the National Aeronautic Association continued. He organized chapters in half a dozen cities, the first ones west of the Missouri River. Also, by collaborating with Standard Oil of California, he was instrumental in air marking more than 600 towns in the west. During this time he took a three weeks hunting trip in the Rockies north of Jasper in Alberta Province, Canada and bagged a moose and two mountain goats at the expense of some very hard mountain climbing. On his return to civilization he found orders directing him to return at once to the Presidio. A plane met him at Portland.

Four Air Corps planes were just completing their round-the-world flight. He was to meet them in Los Angeles and accompany their triumphal flight up the west coast. At each large city the flyers were feted for

the "end" of their adventure. As a matter of fact, they originally had been equipped at the Air Depot in San Diego, but the real end of the trip came in Seattle, where a monument was erected in their honor.

Lahm was next detailed as an Observer at the grand maneuvers of 1925 in Hawaii. He force-landed in a seaplane on a coral reef off the Island of Molokai; was captured by the "enemy," and entertained by Admiral Cain on the flagship of the Scouting Fleet. The attacking force in these maneuvers had been the entire U. S. Fleet with a brigade of Marines to make the landing. The Army was the defending force, and both sides had aircraft. In looking back at the Pearl Harbor fiasco of 1941, Lahm notes that neither in 1925 nor in 1941 did the long-range seaplane find or give warning of approaching enemy aircraft.

Gen. "Billy" Mitchell, during this period had been causing a stir, trying to gain proper recognition for airpower. Mitchell's severe criticism of higher authority resulted in his court-martial and resignation from military service. But his actions did cause President Coolidge to appoint the Morrow Board, whose report, submitted in December 1925, brought about three acts of Congress which provided for assistant Secretaries for Air for the Army, Navy, and Department of Commerce. Until that time there had been no regulation of air transportation. Any amateur could put together sticks, cloth, wheels, and a motor, and carry passengers for hire.

The Army bill provided for three Assistant Chiefs of the Air Corps with rank of Brigadier General. Lahm was one of those named and detailed to San Antonio on 1 September 1926, for four years, to organize and command the first Air Corps Training Center. This Training Center united the Primary Schools at Brooks Field, San Antonio, and March Field at Riverside, Calif., with the Advanced School at Kelly Field, San Antonio. In the fall, General Patrick, Chief of the Air Corps, visited San Antonio and directed Lahm to recommend a site of about 800 acres to which the March Field School could be moved. Four headquarters and three separate schools did not seem logical or economical in manpower, so Lahm conceived the idea of combining all on one field.

Sites were studied and investigated at Dallas, Fort Worth, Houston, and elsewhere. All of these communities offered substantial inducements to the Air Corps. At the same time General Patrick had told the citizens of San Antonio that the Government would buy no land. The terrain within a 35-mile radius of San Antonio was surveyed, and finally a site of land east of the city was selected, covering 3,200 acres. The patriotic citizens of San Antonio guaranteed the funds and persuaded the landowners to sell. The city then assumed financial responsibility, which was to be met by the collection of back taxes.

General Patrick had prescribed a field large enough to accommodate 500 airplanes, more than had ever been operated from a single field. A board studied all the different plans that had been used up to that time, and finally hit on the unique idea of placing all construction in the center, surrounded on all sides by the flying field, with two hangar lines parallel to the prevailing southeast wind. Thus there would be no flying over the buildings. After considerable correspondence, Washington approved the layout. The cost of the buildings, according to the Washington plans, exceeded the legal limit—so authority was given to hire local architects. This proved a wise decision because buildings better suited to the climate were contracted for within the legal limits.

When Lahm's four-year tour was coming to an end in the summer of 1930, many officials from Washington, and commanding generals from Fort Sam Houston and flying fields in the southwest, came to the dedication of Randolph Field, popularly named the "West Point of the Air." The field was named in honor of Capt. William Randolph, former Adjutant of Kelly Field, and a native of San Antonio. In Lahm's four years, 1,000 students had passed through the Center, many of them later destined to become famous leaders in World War II, and Korea. San Antonio came to be known as the "mother-in-law of the Army."

In October 1931 the 150th Anniversary of the British Surrender at Yorktown, Va., was to be celebrated. France sent a delegation of those who had fought with America, among them the de Rochambeaus, de Grasses, and de Chambruns, descendants of Lafayette. The party was led by Marshal Petain, the great French hero of World

Randolph Field, San Antonio, Tex., the "West Point of the Air" where General Lahm organized the first Flying Training Center in 1926.

War I, who was destined to die a prisoner, accused by his compatriots of treason following World War II. It has been said that the French are never so savage as when dealing with their own people.

This must be said for the old Marshal. During World War I, General Pershing had found it necessary to oppose the French High Command in the use of American Troops. Marshal Petain was one of the very few who could see General Pershing's viewpoint, and they became close friends. When the French delegation arrived at Old Point Comfort on two French warships, General Pershing was at the dock to welcome his friend. Colonel Lahm reported to the Marshal to serve as his Military Aide. Then followed ten days of memorable events; the great pageant at Yorktown reenacting the surrender of 1781 with the troops dressed in the uniform of the day: a reception at the Governor's mansion in Richmond; receptions in Washington; and a visit to Annapolis. General Pershing took the old Marshal for a drive up the picturesque Hudson to West Point, where he showed him the room he had occupied as first Captain of the Corps of Cadets 45 years earlier. One can well imagine the emotions felt by these two old soldiers in this background.

Earlier in the summer Lahm had received orders from Washington appointing him Air Attaché to France, Spain, and Belgium, with headquarters in Paris. However, Lahm now received alarming news telling him of his wife's illness. He rushed to Cleveland but, during a stopover in Pittsburgh, learned of her death. Lahm then was faced with the task of bringing up his two young children without the aid of a mother. In the face of his new assignment, wonderful help came from an unexpected source. His niece, Mary McConnell of Cleveland, offered to take charge of the children, brought them to New York and all sailed for France on the "Roosevelt" on November 11th. Lahm, Sr., survived only a few weeks after this. He died in his Paris apartment and was returned to Mansfield for burial, with military honors, a recognition of his contribution to the Government in Aeronautics. When General Stanley Ford was relieved as Military Attaché in France, Lahm was given this additional duty, and still later was named Military Attaché to Belgium.

Diplomatic life in Europe was interesting and Lahm's command of the French language was a definite asset. He renewed old friendships of his Saumur and World War I days, among them General Weygand, then Chief of Staff of the French Army. Meetings of the various foreign Military Attachés in Paris brought together an interesting group, among whom was General Kulenthal, the first attaché from Germany since before World War I. Every summer Pershing would return to France as head of the Battle Monuments Commission and would always entertain his old friend Marshal Petain at the Hotel Crillon. Among the few always invited was Colonel Lahm.

Events moved swiftly on the international scene in the period 1931 to 1935, and thereafter. French military forces were gradually growing weaker for lack of a strong central government and strong leaders. Hitler came to power in 1932, tore up the Versailles Treaty, occupied the Rhine Valley, and built up a powerful military force. Mussolini marched into Abyssinia, daring to do so only because the former Allies and the League of Nations failed to express disapproval.

The year 1932 was one of momentous decline in the French government. The King of Yugoslavia and French cabinet minister, Barthou, were murdered on the Riviera by a crank. From their windows of the Embassy on the Place de la Concorde, members of the American legation witnessed mob rioting, and the storming of the French Chamber of Deputies. It is felt that these actions were engendered by scandals in high places, and by the weakness of the government. Once the Mounted Garde Republicaine charged a mob and was stoned. Then suddenly, it all stopped when a notice was posted on a tree in the Place de la Concorde announcing the resignation of the current government.

Also, by 1935 it had become plainly evident that Germany was on her way again to become a great militant power. (It must be accepted that industrious nations such as Germany and Japan cannot be held to minor roles in the affairs of the world.) Although the four years in Paris had been full and interesting ones, Lahm welcomed a return to the homeland. He reported to Governor's Island, N. Y., as Air Officer of the Second Corps Area, and later headquarters of the First Army when they were reorganized there. His duties as Air Officer took him north as far as Newfoundland and as far south as Columbia, S. C. On one occasion, by invitation from the German Ambassador, he experienced being shot from a catapult from the deck of the "North Sea" in Long Island Sound.

On April 16th, 1938 Lahm gathered with a group of notable aviation pioneers at Dearborn, Mich., for the dedication of the Wright home and bicycle shop that Henry Ford had brought from Dayton, Ohio. Among others present were Orville Wright, Henry and Edsel Ford, C. F. Kettering, Dr. George Lewis of NACA, W. R. Gregg of the Weather Bureau, Vilhjalmur Steffansson, Arctic explorer and a long time friend of the Wrights, William E. Scripps, publisher, Griffith Brewer from London, Generals B. D. Foulois and Frank M. Andrews, Colonels F. E. Humphreys and Charles Chandler; and Charley Taylor, the Wrights' only mechanic during all their early work. In addition there were numerous Wrights of the younger generations. Lahm was one of the speakers at the luncheon at the Dearborn Inn.

While on duty at Governor's Island, Lahm approached his 64th birthday, and that meant, by law, retirement. In September 1941 he received orders promoting him to Major General, and directing him to proceed to Randolph Field to take command of the Training Center which he had organized in 1926. This assignment gave him a promotion and the satisfaction of ending 45 years of active service in a command he had been first to occupy, and at a field which is considered his creation more than that of any other individual.

The Training Center had grown from three to 35 bases, scattered over several states, and was busily preparing pilots for what threatened to be another major conflict. A final review on November 30th, 1941, at Randolph

Maj. Gen. Frank P. Lahm, Commanding General of Gulf Coast Air Corps Training Center, hears his retirement order read during a gigantic land and aerial military review in his honor at Randolph Field, Tex., Nov. 30, 1941.

brought flying cadets, officers, troops, Army and Air Corps generals, and planes from many points for a happy ending to General Lahm's career. As he stood sharply at attention at the review, his thoughts went back through the years—the West Point diploma, the horse Cavalry, the pioneering in aeronautics, military and civilian, his foreign service in the Philippines and France, his active part in the First World War, his distinguished family and host of friends. He could not have asked for more.

Following retirement Lahm went to live with his daughter, now married to Capt. R. E. McMahon, Medical Corps, and living on Governor's Island. It was here that he, together with the millions of other Americans, was startled by the news of Pearl Harbor. He immediately offered his services to Gen. George C. Marshall, Chief of Staff, but with the Air Corps in need of young men, he was not called upon.

Some years before this, his friend, Colonel Chandler, Signal Corps, had informed Lahm that he was preparing a history of the Air Corps and that if something prevented completing the task, Lahm was to do so. Chandler died in 1939. His executor turned over to Lahm the vast file of material he had accumulated. Lahm spent a whole year sorting, coordinating, filling in the gaps by correspondence with those who had an early part in the history of the Air Corps, and in general, rewriting.

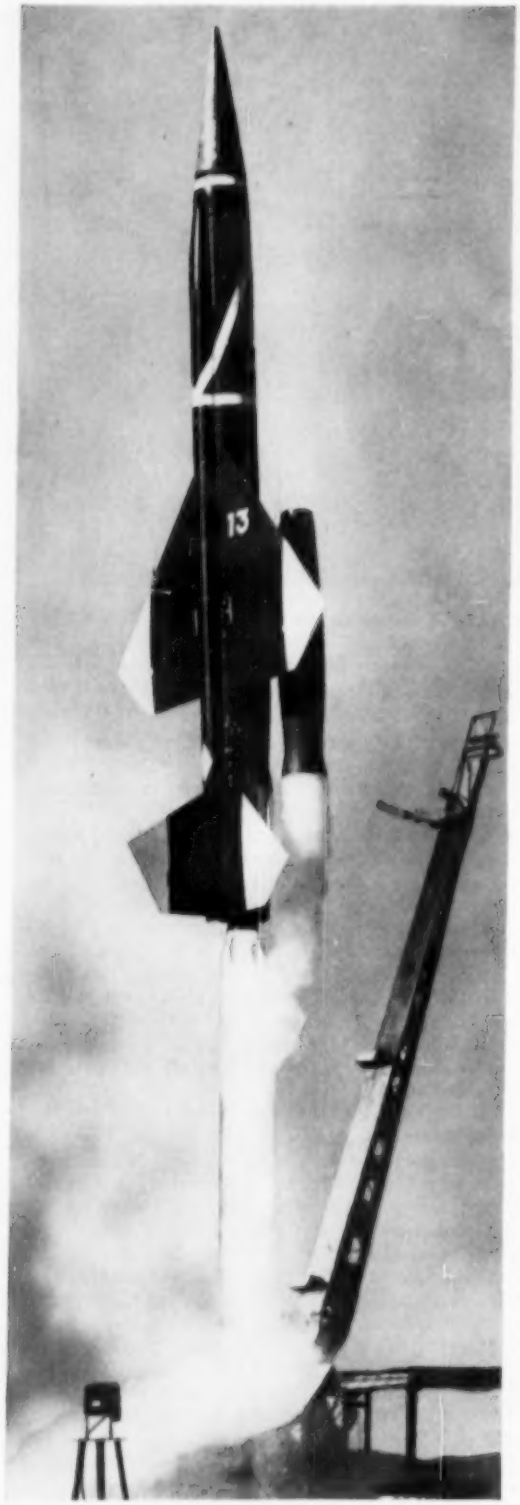
In 1942, "How Our Army Grew Wings" was published by the Ronald Press for Chandler and Lahm. This book covers the history of aeronautics from the invention of the balloon in 1783, through the observation balloons in the Civil War, the story of the Wrights and the invention of the airplane, the intermittent air activities of the Signal Corps up to 1914, the creation of the Aviation Section of the Signal Corps, the first recognition of aeronautics as an activity separate from all others.

But retirement for General Lahm could not mean inactivity. He plunged into a ceaseless welter of national and civic affairs with the same zeal that characterized his long career as a soldier and airman. War Bond drives, the Council on World Affairs, the "Early Birds," the Boy Scouts of America, and kindred organizations felt the impact of his enthusiasm.

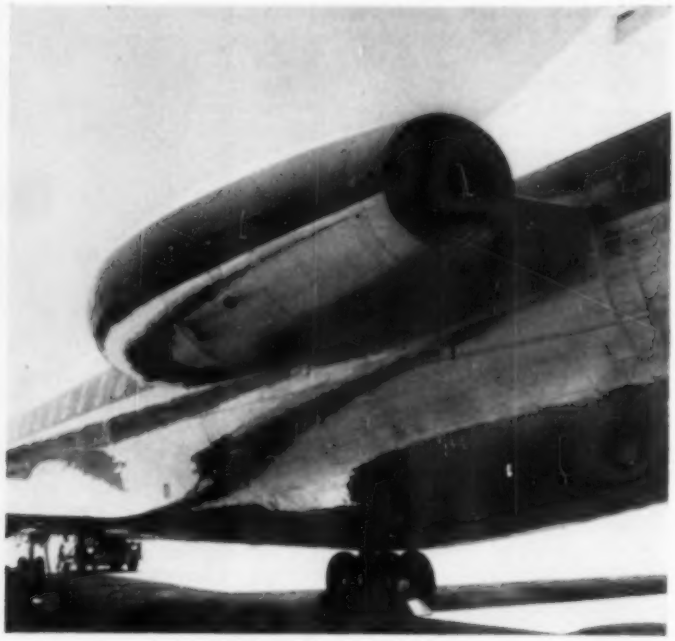
By 1946, his son Lawrence, a notable athlete and honor man at the Point, but barred from aviation for eye defect, had been graduated and sent to Ecuador as an instructor of that army. General Lahm visited him, turned his interest to South American affairs, and in the years since has come to know the lands south of the border as he previously had known Europe and the Orient. In 1948 he married Grace Wolfe Kenson, an old Mansfield High School classmate, and widow of George Kenson of Mansfield. The couple spend their winters in California and the remainder of the year in Ohio, close to families and friends.

The year 1953 marked the 50th Anniversary of powered flight which started with the Wright Brothers' history-making achievement at Kitty Hawk, North Carolina, December 17th, 1903. At Washington, in October of that year, a remarkable assembly of pioneers got together. Caproni came from Italy; Breguet came from France. Others who attended were: Dolfuss, Lahm's early balloon associate; Paulhan, who was engineer on the "Ville de Paris" on Lahm's first airship flight; A. V. Roe of England; Messerschmitt of Germany; Early Birds, J. A. D. McCurdy from Canada; "Tommy" Milling, Glenn Martin, Grover Loening, Ruth Law, Admiral Pat Bellinger. Still others were: General Foulois; Admirals John Towers and A. C. Ree; and Reuben Fleet. Other early pioneers came from the Netherlands, Brazil, and Mexico. Never again can there possibly be a gathering of so many who made original aeronautical history.

We of the present are infinitely fortunate to have at first hand the authentic reminiscences of these who changed the course of history by their faith and vision. Centuries may pass before the final evaluation of their efforts, but in the meantime we may see far enough down the road to know certainly that no group of individuals ever more revolutionized the human story. END



BOEING IM-99 BOMARC. Two wing-mounted ram-jets and a liquid fuel rocket in the tail power this supersonic interceptor missile. It is guided to the vicinity of enemy aircraft by ground radar after which its own guidance system takes over for the kill.



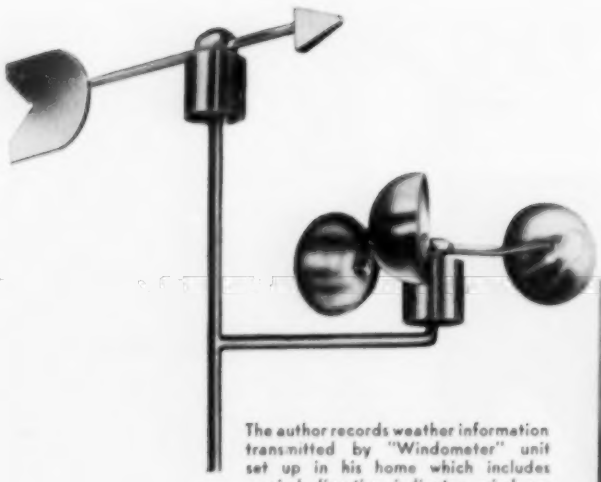
CARAVELLE DETAILS Photo at top shows unorthodox installation of Rolls Royce Avon engines on the French twin-jet airliner. Below: Aerodynamic fences, and extended dive brake.

NORTHROP T-38 Artist's drawing of light supersonic trainer now under development by Northrop Aircraft Inc. Student and instructor are seated in tandem cockpits. Raised rear seat enables the instructor to check student's movement and reaction, in addition to providing good forward visibility. First aircraft to be specifically designed for supersonic training, it can operate from short runways.

ANGEL KITTEN Neat homebuilt biplane owned by two West Chester, Pa., pilots, Garzia and Purnell. The airplane, known as Gauther Special, is powered by an 85 hp Lycoming engine, is equipped with the two-position Sensenich prop. Span of top wing is 16 feet, bottom wing 14 feet. Maximum speed is 140 mph. Plane was renovated at the Kutztown, Pa. airport including a high gloss paint job in white and red.

RYAN X-13 VERTIJET Below and right. First full scale piloted VTOL utilizing the jet thrust for vertical flight. Maneuvering in upright position and transition to normal attitude is accomplished by the deflection of exhaust and throttle variation. Plane lands on vertically erected platform hooking on to a cable. Pilot is guided, on approach, by sighting along a whip-like pole and following instructions from crewman located in a crow's nest. The platform is then hydraulically lowered (below) serving as a trailer to transport the Vertijet. Tubular frame on bottom of fuselage acts as bumper.

HAVE YOU SEEN?



The author records weather information transmitted by "Windometer" unit set up in his home which includes a wind direction indicator, wind velocity indicator (left) and barometer.

Observing frontal movements aids in safe VFR flight planning. The need for a complete and accurate weather picture prompted this pilot to set up his own

Private Weather Station

By TED DUROSKO

THE PRO'S NEST

WHEN I MOVED MY HOME base from Cleveland-Hopkins Municipal to a private field at Northfield, Ohio, some 25 miles to the southeast, I soon found that I missed the services of a modern weather bureau station. Even though I had installed a low frequency receiver at my home near the field, the weather sequence of cities within a 200-mile radius, usually the extent of many of my trips, did not give me a complete picture of the weather I would encounter.

I discovered this during my second trip out of the private field. That particular morning I planned to fly to Lake Chautauqua, Jamestown, N. Y., 130 miles to the northeast. Cleveland was reporting 2,200 feet overcast with five miles visibility and smoke, while Erie, Pa., 47 miles west of my destination, reported 4,000 feet overcast with ten miles visibility.

On the basis of the reports, it appeared that the 1:10 hour flight could be made VFR with no sweat. I wound up the Lycoming in the PA-12, took off and picked up a northeast heading. The ceiling was holding about 2,000 feet and visibility was between four and five miles.

After 30 minutes flight I approached the Pennsylvania border and noticed moisture forming on the windshield. The ceiling began to lower and I flew through several short showers. In the next five minutes the ceiling went down to 1,500 feet, visibility became two or three miles, and the showers became more intense. I called Erie Radio and asked for their latest report. The answer was 4,000 overcast with visibility of more than ten miles. As I was but 20 miles from their station, I presumed I had encountered a local condition which would soon be behind me. But this was not so. Within a minute after hanging up the mike, I flew into a solid wall of moisture. Visi-

FIG. 1.

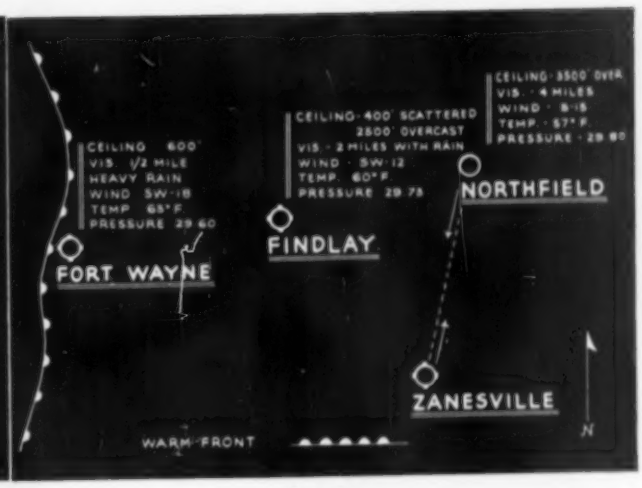


FIG. 2.

bility dropped to zero and heavy rain rocked the Super Cruiser.

This undoubtedly was more than a local condition and I executed a 180. Once out of the heavy rain and with visibility again at about three miles, I noticed that the wall of rain extended in a line as far as I could see. Under such conditions I picked up a heading for Port Meadville, Pa., eight miles to the south where they were VFR.

On the ground at Meadville, I listened to each weather sequence. Sure enough, the heavy rain and poor visibility moved right into Erie. They went from VFR to IFR within 45 minutes. The weather later moved through Erie and on to the northeast. I waited until VFR conditions returned along my course, two hours later, and proceeded to my destination.

This weather phenomenon aroused my curiosity and on my return trip I swung in an arc by way of Youngstown, Ohio, and checked with the weather station. Their records showed that a "weak" front had existed west of Erie that morning. The incident pointed out to me that I needed more than weather sequences to get an accurate picture of the route for flight planning. I then augmented my information with the Cleveland daily newspaper weather map. This did not, however, prove satisfactory in all cases as my relatively short trips were too small a line to plot against the coarse newspaper map.

The map did, however, give me general information on any front within several hundred miles and indicated its direction of movement. This stirred my interest in obtaining weather observing equipment with which I could detect movement of the front, and anticipate its approach to my intended path of flight.

The next step was to locate equipment. In looking over the market, I ran across the "Windometer" unit manufactured by Aircraft Components of Benton Harbor, Mich. The economically priced unit consisted of a wind direction indicator, wind velocity indicator, and a barometer. I was pleasantly surprised with the accuracy of the Windometer when I checked it against official weather bureau equipment. To this equipment I added an outside air temperature gauge and started into the business of making my own forecast of frontal movements.

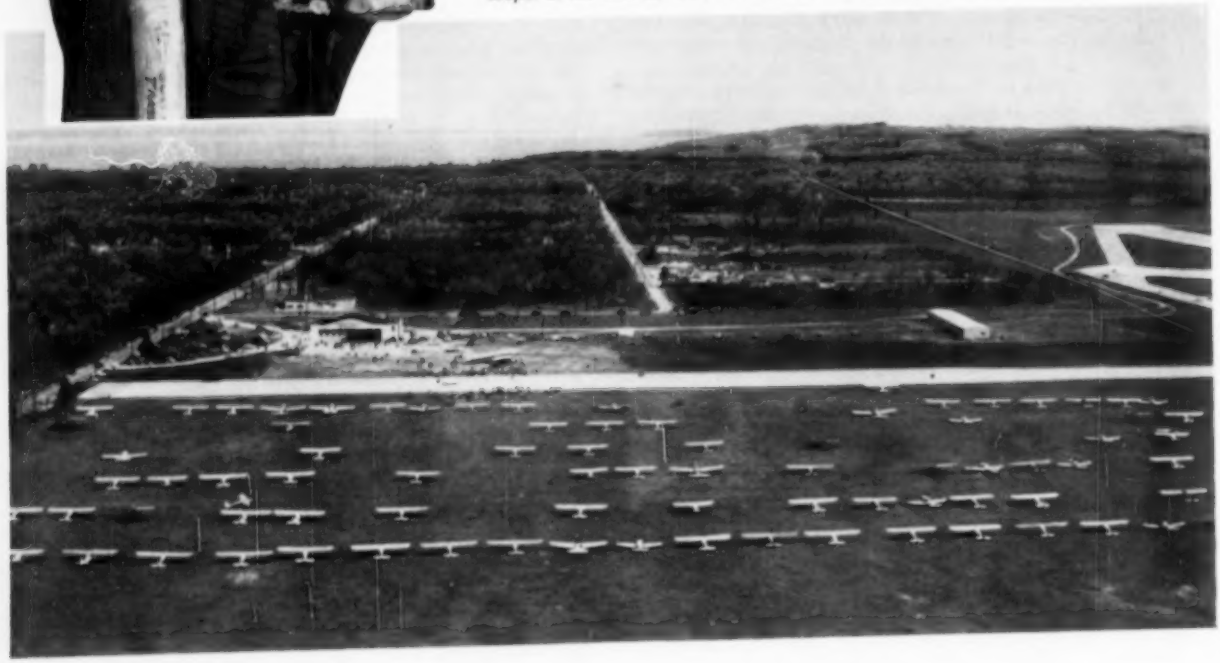
Perhaps at this point it would be well to review briefly characteristics of a front, for it is its accompanying ceilings, visibility, precipitation, temperature, barometric pressure, wind direction and velocity that aid us in forecasting its movement. The entire weather mass starts when two different air masses meet and do not mix. This causes them to set up boundaries called frontal zones or fronts, with the colder air mass projecting under the warmer in the form of a wedge. As the boundary or front moves along the earth's surface, in the case of a moving front, the withdrawing air mass from a given area is replaced by another air mass. If warmer air is replacing colder air the front is classified as "Warm"; if colder air is replacing warmer air, the front is labeled "Cold."

Warm front—When a warm front moves forward, the warm air which is usually of high humidity slides up over the wedge of colder air lying ahead of it. As soon as the warm air is lifted, its temperature is lowered, condensation occurs, and fog and drizzle begins to form. As the lifting process continues, low nimbostratus and stratus clouds form, and drizzle develops (*Continued on page* 88)

Left: Lt. Governor Philip Hart of Michigan and his wife, Jane, went "down the tote road" in 1955 while Chairman of the Bunyan Committee, Walter J. Carr, Sr., (center) fondles Babe.

Below: Shirley Swanson, the lovely "Miss Michigan" of 1956, went over the trail last year.

Left: John Quick, chairman of the Chamber of Commerce Aviation Committee is keeper of the blue ox. Below: The 1949 meeting of the Clan, at John Bunyan airport.



Between the lake and the hills
near Traverse Bay in northern Michigan lies a
modern airport which is the home of

THE PAUL BUNYAN CLAN

By ZANE BARNES

A surprised candidate for the Clan sees Babe, the blue ox, after kissing him while blindfolded.

EVERYONE—WELL, MAYBE not everyone—but certainly every lover of tall tales of the timber country from Michigan westward, knows about Paul Bunyan. But in case this might not be the case, I will set down certain established lore concerning Paul. It is well known, in some quarters, that the gargantuan Bunyan trekked north to the big woods every winter and operated a huge lumber camp between the winter of the blue snow and the spring that came up from China. To help him handle the very largest logs was Babe, the blue ox. Babe was the pride of Paul's heart and measured 42 ax handles and a plug of tobacco between the horns.

As would be natural, many talented writers have devoted their talents to Paul and Babe. I am sure that much of what they have written is allegorical and would not stand up in law.

The nearest I have come to an indisputable incident in Bunyan's life is the formation of the Paul Bunyan airport at Traverse City, Michigan. This story has to be believed for there the airport stands—prima facie evidence for anyone who wants to go and look at it, and I hope everyone will for it's a wonderful place.

Its original grading and landscaping came about in this manner. Travelling north toward the big woods of Canada one autumn, Paul as usual had to pass through Michigan. On this particular evening he was especially weary and thirsty, as was Babe. They decided to camp for the night near beautiful Grand Traverse Bay.

The great Paul and his ox set about making themselves comfortable, Paul smoothed the ground with his mammoth ax and piled the dirt to the east end of what was to be his bed. This hummock he would use as a pillow. At the west end of his bed he scooped out a great hole and let it fill with cool water from a meandering spring-fed river. In this pool, later named Boardman Lake, he cooled his tired feet.

Naturally, it took very little genius for pilots who came upon the place in later years, to realize that this flat spot between the Bay and the hills had been tailor-made for them—and that the lake was also ideal for seaplane landing and anchorage. They would have been nothing less than a lot of ingrates to have named the airport for anyone other than Paul Bunyan or to have doubted how it came into existence. But they went even further to their great credit. They formed a Paul Bunyan Clan.

The Paul Bunyan Clan was *(Continued on page 78)*

Right: The Traverse City Paul Bunyan airport boasts four 5,000-foot hard surface runways.

An improvised air circus to promote a country auction turned out to be another of those

OX-5 ESCAPADES

By PENNY ROGERS

MR. KNOWLIN, PENNY and I can triple the attendance at your farm auction Saturday," said George, "Mile-Hi" Carmack. "Penny is the best stunt pilot now in Georgia and my precision chute work is the talk of the profession. We can fly from that pasture east of the barn. A newspaper story that the 'Rebel Air Devils' will headline the entertainment will pull 'em from the boondocks."

"Well, I don't know about that, sonny," said the lanky Mr. Knowlin, every inch an auctioneer. "Lemme see now, you said you would put on a show for $100 guarantee? Tell you what you do—bring me a little outline of your plan and maybe I'll sign it."

"Okay, Mr. Knowlin, we'll be here at three o'clock with a program and contract for your approval."

The old model "A" went bouncing down the three miles of red ruts toward Norcross while I tried to argue Mile-Hi out of this silly deal.

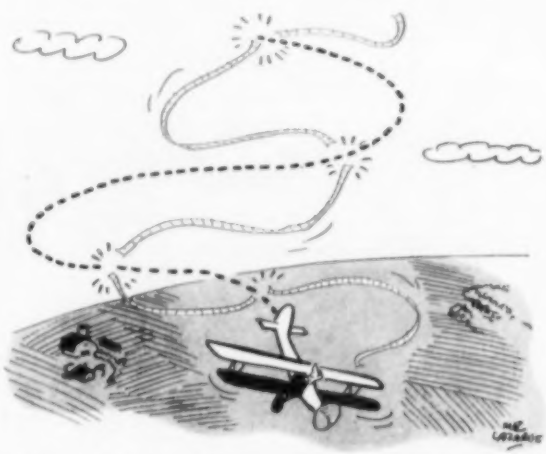
"Where in the hot heart of Hades are you going to get an airshow together in three days? You've done a few jumps and I have fallen out of a few loops, but an air circus! Holy Hannah, your brains must be out of rig. And what are the 'Rebel Devils' going to use for airplanes?"

Carmack looked at me like a small boy caught cussing in church. "Look, Penny, you got that short nose American Eagle and I got my Triangle chute. We can get some of the other boys to aviate up here from Atlanta for gas money and fly cow-pasture formation. I'll do a jump or two and you can slop around in the sky. Bring some toilet paper and do a 'Serpentine cutting' number." The great Mile-Hi took a couple of breaths while I informed him that my old Eagle wouldn't get that high.

"Well it's this way, 'One Cent', we're broke and there's a chance we can get a few bucks advance on our contract." Carmack said. "We can peddle barnstorming rights at the auction. But even if we can't get any help, you and I can put the whole thing on."

Carmack drew up a neat contract. I helped him work up a program—of which we could do about half, if we had a good airplane. When we went back I was hoping Mr. Knowlin would be gone, but he was there. Carmack went over the contract and program with him. When they got to the clause calling for $25 advance, I felt my worries slipping away because I knew Knowlin wouldn't sign. To my surprise, he did. What a mess we were in now!

On the way back to Atlanta we firmed up our plans as best we could. I dropped Carmack at his house, warning him to show up at the hangar early in the morning. The next two days were busy ones. We rounded up two chaps who said they would go. One had an OX-5 Waco, and Pete Clay had an OXX-6 Eaglerock. I had a friend named Bill Records who was ferrying a Type 6,000 Travel Air to Florida. He was having engine trouble but thought he could be ready by Saturday, and would like to pick up a few bucks hopping passengers. I bought a new set of points for my beat up old mag, re-set the plug clearances, fixed a leak in the radiator and was as ready as I could get. My motor just barely turned 1,250 rpm. Carmack called Mr. Knowlin Friday night and reports were good as to pasture and weather.



"Bring some toilet paper and do a 'Serpentine cutting' number."

Saturday morning dawned clear after a few showers during the night, so away we went. I took off first; then the Waco; then Bill in the big six-place Travel Air, then Pete in the OXX-6 Eaglerock. Pete and I arrived over the field together and that cow lot sure looked short. However, Pete swung in for a nice landing. I followed and had to ground-loop out of the fence, tearing up some grass. Next was the Waco. He fluttered around awhile looking at my tracks and went back to Atlanta. Records came over, took a swing around the field and made a three-point beauty.

"Well, well," said Mr. Knowlin, "I wondered if you boys would show up. Where is the rest of your air show?"

"We will call the other airplanes in as the crowd increases," Carmack lied, "Where is the rest of your crowd?"

We did have about 200 people (*Continued on page* 83)

"When they returned, the enthusiasm over that 'thrill ride' really put Pete in business."

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I learned about flying from that !

This pilot was in a desperate plight—lost at night over the Cascades.

By WALTER H. MORRISON

PORTLAND Radio—Portland Radio—16429 calling Portland Radio. Mayday—Mayday—come in Portland."

Over and over Portland answered, "429—429—Portland reads you loud and clear. What is your trouble?"

Only to have the voice reply "Portland, I cannot read you—your voice garbled and mushy."

Finally the voice, now somewhat calmer, booms in over the speaker—"Portland, 429 is a Monocoupe—Pilot Morrison—wife as passenger—en route Medford to Portland and lost over high mountains somewhere near you. Our receiver must be going dead. We're at 11,000 feet—running out of gas—it's getting dark. Will try to get back to big river we crossed. No chance for us here. Rocks and snow below and heavy timber ahead. We're throttled back in a flat glide. I'll leave transmitter on and describe landing area if I have time. Wish us luck!"

Nothing further for nearly an hour. Suddenly the telephone rings. The Portland operator, leadenly and with certainty in his heart, picks up the instrument to hear—"Mr. Morrison calling Portland Radio from Cascade Locks. Go ahead please."

"Morrison," he almost screams, "where are you, and how are you?"

"Cascade Locks," the voice replies, "not hurt at all, and even saved the ship!"

"But you can't be," sputters the operator, "there's no place to land there."

"Yes there is," Morrison's voice comes back, "and I'm in it. There's a pasture next to Haskin's Fur Farm. Awfully sorry to have worried you. Good night."

The author and his Monocoupe after his hair-raising forced landing.

A couple of thousand more hours have in no way dimmed my memory of that flight, for mine was the voice calling for help; and mine were the mistakes leading up to the events described! Let me fill you in!

Early that morning my wife and I had left Bay Airdrome in Alameda, Calif., to spend the weekend with friends in Portland. It was our first real cross-country in our recently acquired Monocoupe, with an exceptional radio installation that could raise Fresno from the ground at Alameda.

We'd never been to Oregon, had no experience with radio ranges, and only a very general understanding of their operation. One of my pals presented me with a strip map that showed the whole trip very compactly (but only to Portland) and had main landmarks—radio ranges—frequencies—call letters—headings, all nicely laid out.

The sky was clear as we came abreast of Mt. Shasta. Tuned to Medford Radio, we learned that Medford was overcast with heavy fog, but Klamath reporting clear—light haze only. Radio was wonderful! Changing course slightly, we landed at Klamath Falls about 10:30.

It was nearly 2 p.m. before we got started again, heading west over ridges and valleys packed with dense fog. An hour brought us to Medford, marked for us by a tall column of smoke and a few holes. We were advised to land and wait for the next sequence. Looking west, the fog seemed more dense, so down through a hole we went.

Here the common factors in impatience, ignorance, and plain bad judgment began to set the stage for the drama to be played out over Portland Radio only a little later. The next sequence, for which we waited, reported Grant's Pass and the lower Willamette still fogged in, but Salem and the upper valley, broken to clear improving to light smoke and haze at Portland. It *was* getting late, but a direct heading to Salem, while taking us over mountainous country, would bypass the fog-bound lower valley, and bring us into the clear at Salem, for a straight ride into Portland—about one hour, twenty-five minutes, and our gas good for about three hours. If we got right back in the air, we could make our destination well before dark. Off we went!

A half hour's flight brought us in sight of the Willamette Valley. Check points on our trick map were turning up regularly right where they should be. Switching to Portland Radio's frequency, the steady "on course" signal and identification sang in my ears so loudly that I cut it way back in volume and handed the phones to my wife. I explained that the volume would build up as we approached Portland, and that any drift to one side or the other of our course would change the steady signal to an "A" or an "N" and require correction. Salem passed by our left wing tip, and I busied myself trying to find and identify my mother's birthplace—Shedd—on my map. Radio made things so easy! I settled back and relaxed. How fat-headed could I get?

Now up ahead, a good sized river showed up. Checking the map, it *had* to be the Willamette. Both the Willamette and Columbia looped across the valley approximately parallel with the Willamette shown only slightly smaller and more meandering than the Columbia. Having (*Continued on page 87*)

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Fido was No Dog

(Continued from page 26)

The National Physical Laboratory constructed a wind tunnel at the Earls Court Skating Rink where artificial fog was produced.

It was proved that fog could always be dispersed if air temperature could be raised approximately four to seven degrees. Air Chief Marshal, Sir Arthur Harris, head of Bomber Command, set visibility standards to be achieved in fog conditions. He wanted visibility of 1,000 yards in length by 150 feet in width to a height of 100 feet—500 yards of the visibility was to be on the approach, and 500 along the runway. This was exceeded on many occasions after FIDO became an accomplished fact. Following the war, Harris said that 15 airports equipped with FIDO had enabled him to cross up German meteorological reliability, and maintain continuity of bombing offensive. The morale of his pilots shot up. There was now no need to bail out and sacrifice planes over home airfields.

Every method which might achieve results was originally tested in full scale experiments. Dispersal of fog by supersonic waves was attempted. Large electrical charges were sparked off. Chemical absorption of moisture was tried. Experiments in drying fog by refrigeration were exhausted. Outdoor air conditioning apparatus was built. One grotesque piece of apparatus I saw at Graveley Airfield consisted of enormous propellers mounted on Rolls-Royce Merlin engines, mounted on a large mobile carrier. The idea was for the propellers to blow hot air across the runway. A battery of these met with a measure of success.

One foggy night near Staines Surrey, I came on a long line of coke burning braziers and on another line of oil drums burning petrol, and throwing off clouds of sooty smoke. I did not know it then, but what I saw was the experiment which gave the first successful clue to the problem. Not knowing what was going on, I did not mark the fog clearance, but scientists were observing the results with great joy. For the first time in history, fog had been cleared by man-made apparatus!

Following this, large scale installations were assembled in fog ridden localities, and a special mobile unit was manned by Royal Engineers ready to move on to any field where fog was reported. For a time, experiments were conducted with both coke and petroleum. Coke produced less smoke but took longer to light up and involved more manpower. Petroleum could be piped easily to any site, from the country-wide network of pipelines then being developed.

When the smoke problem, which was initially severe, had been solved by vaporizing the fuel, it was decided to concentrate on petroleum. In January, 1943, research facility runways were constructed for testing and trial of numerous type burners, and methods of vaporizing. It was decided to install a full scale operational unit of parallel lines of burners 50 yards from each runway edge, at the Bomber Command's pathfinder base at Graveley. Air Vice-Marshal Bennett, Chief of the Pathfinders, first landed by the light of this installation on February 18, 1943, though not in conditions of fog. He reported that the glare had at first looked formidable, but that once within FIDO, conditions were like daylight and turbulence was little more than on a normal bumpy day. Soon another Pathfinder airfield at Downham Market, Norfolk, was provided with FIDO.

No opportunity presented for a real fog test until 17 July, 1943, when visibility fell to 100 yards. FIDO extended this to a fog clearance of 1,300 yards. An aircraft experimentally took off and landed four times in the cleared area.

Forty-five days after this successful demonstration, six FIDO installations had been completed, ready for the autumn fog season. The first operational use of FIDO took place on November 19, 1943, when four Halifax bombers landed successfully after a mission to the Ruhr. The visibility on the airfield was only 100 yards but ten minutes after the burners had been lit, it increased to the useful equivalent of from two to four miles. Between that day and V-Day in Europe, more than 2,500 Allied aircraft were safely landed, many of them in conditions of intense fog, with their crews of over 10,000 men. Fifteen FIDO installations dotted England including each of the three enormous emergency runways at Carnaby in Lincolnshire, Woodbridge in Suffolk, and Manston in Kent. These runways were 3,000 yards long, and 250 yards wide, and were built for landing aircraft in distress when D-Day arrived. Because of the great width of these three runways petroleum there was burned at the rate of over 200,000 gallons an hour.

At Manston where FIDO was installed in April, 1945, it landed 122 aircraft in emergency due to fuel shortage. Once when the burners were fired to land four heavy bombers, 17 unexpected fighters with dry tanks also got down. The U.S. Army and Navy Air Forces were kept fully informed and early in 1944 a FIDO technical team assisted in the design of installations for Navy in the Aleutian Islands, and for Army at Wright Field, Dayton. An exchange of ideas resulted in the use by the British of American flares for automatic lighting of the burners, previously accomplished by hand torches or matches.

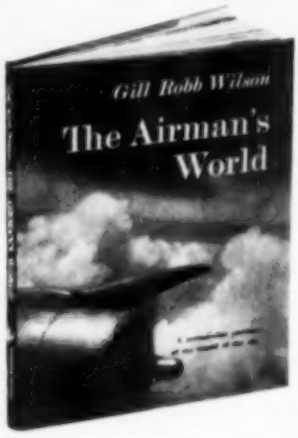
After invasion of the Continent, tactical airpower made good use of FIDO as it was moved forward to France and Belgium. Portable units were designed for easy transport, by air if necessary, and for minimum effort in operation. Petrol was pumped by hand from barrels, and used by both RAF and USAF.

The red glare of the burners shows through on the top of the fog belt, and could be seen for great distances, even from far over the North Sea, and quite easily from the Dutch coast. One night I took off from Silverstone in Northamptonshire to land by FIDO at Woodbridge, in Suffolk. I was able to pinpoint the field from 50 miles away by the glow in the sky. Close navigation for approach was not necessary. My only landing plan was to fly to a beacon east of the airfield, and run straight in from there at five mph faster than normal to give me better control when I hit the bump caused by the upward rush of hot air as I passed over the crossbar of burners at the threshold of the runway. One of the crew was detailed to call the instrument readings aloud, and those in the cockpit were forbidden to look at the flames to prevent being blinded by the glare at close range. Coming down into the glare between two lines of burning oil was quite a sensation—like diving into an inferno—but thousands of Allied pilots welcomed the experience with joy.

In addition to the side burners, four rows were put down at the approach end, and also short burners to mark the touchdown area. Gaps were left at one side to allow damaged aircraft to be pulled off the runway.

The amount of fuel necessary to operate FIDO was immense. At Graveley, for example, the "fog" runway was 2,500 yards long, and 150 feet wide. Petroleum was burned on part of it at the rate of 75,000 gallons an hour. Fifteen minutes

(Continued on page 74)



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I'll Take Seaplanes

(Continued from page 31)

break in weather. The first few days were calm and clear; the last few, cloudy and windy. Nothing could have been better for the transition of a landlubber to a floatman. Within a few hours I had added new terms to my vocabulary—such jargon as step-turns, port, starboard, keels, bitts and water rudders. That in itself was an education.

I found that in flight the aircraft behaved just like its counterparts on wheels, but seemed to have a little more stability. It sounds odd, to say that a J-3 could have more stability. Perhaps it is due to the added weight below the center of gravity, and maybe noted aerodynamicists will not agree with me. Take-offs and landings weren't as difficult as anticipated. On take-offs, the floats track straight and true, unless some outside force, either wind or rudder, is applied.

First, the float is sitting flat in the water, or in idling position. Take-off is started with the stick full back. During the first few seconds of the run, the nose will continue to rise. When it reaches its steepest angle of inclination, most of the back pressure is released. The nose drops to only a slightly nose high position. The float rises to the step, and now very little of it is in the water. At this point, the acceleration is quite a sensation. A slight back pressure only is needed under normal conditions to bring the aircraft clear of the water.

One can develop trouble getting onto the step with an overloaded aircraft. A few seaplanes will come up on the step with a load they will not lift off the water. This, however, cannot occur if one is operating an aircraft in accord with the limitations set by the manufacturer.

Cross-wind take-offs are a big thrill. When the aircraft has come up on the step, considerable aileron is fed in and one float lifted clear of the water. This not only gives a wing low into the wind, but substantially reduces the drag.

When faced with rough water, one must study the particular situation and plan ahead. The problem is not unlike shooting muddy field or short field take-offs in a land-locked type. Procedure should be thought out and each step calculated in advance. Rough water comes in various sizes and shapes, it can be anything from a small wave to a rip tide; from ground swells to big crested waves. Rough water too has a different meaning for each float pilot. It's like spot landings. Some people are better at it than others. A good rule of thumb for the beginner is that when the distance vertically from the trough to the crest of a wave is over two feet, back into the sack, boy! The general idea under any circumstance is to keep the floats from digging in. Apply full power only as the nose is going up on the crest. Full aft control is used to keep it clear.

As the plane begins to accelerate, it will start bouncing from crest to crest. At each crest, the nose will try to go higher. It is often necessary to hold for-

(Continued on page 66)

One of North American's three Apaches takes off over F-100 Super Sabre

PIPER APACHES HELP SPEED F-100 SUPER SABRE PRODUCTION

To meet their requirements for fast, economical, interplant transportation, North American Aviation, Inc., world's largest builder of military airplanes, chose the twin engine Apache built by Piper, world's largest manufacturer of civilian aircraft.

Before the Apache was chosen, an evaluation of all available twin engine aircraft was made for the company's special transportation needs by three separate groups at North American. The Chief Engineering Test Pilot studied flight characteristics, engineering features and structural integrity; the Chief Transport Pilot evaluated utility; the General Supervisor of Flight Test checked all-around performance and maintenance.

As a result of these three separate evaluations it was concluded that the Piper Apache was the best airplane to fill this specific transportation requirement at lowest cost with no compromise in quality, structural integrity, flight characteristics and performance.

Since selecting the Apache a year ago, North American Aviation's fleet of three Apaches has flown over 2,400 hours—30 per cent on IFR flight plan. The Apache has far surpassed North American's expectations.

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Veterans: Check here ☐ for Special Veteran Training Information.

(Continued from page 64)

ward stick and to keep from stalling. However, it is also necessary to get the stick back as you start into the next crest. It sounds rather complicated, but actually isn't. If there is enough wind to kick up this kind of sea, you won't be on the water long.

Another interesting feature is that, if you have to get out of a confined area, you can go up on the step downwind, and make the turn back into the wind almost ready to clear the water. However, step turns are something to be practiced dual for a long time before one tries them solo.

There is one cardinal fact to be remembered in seaplane flying. Small boats travel very fast and change course for no apparent reason. *You have to clear your area, and be sure it will remain clear for the time required by your take-off.* On water you are operating under rules set up for water-borne vehicles. Regardless of who has the right of way, you will get the worst end of a collision.

Landings are a dream. With the possible exception of glassy water, anyone who has flown aircraft which sit down at less than full stall will have very little trouble with normal sea landings. The smoothest float landing is made by placing the stern of the float, or the section from the step to the stern, in the water just prior to the stall-out. If the plane stalls before the floats are in the water, naturally, it will fall in. Full stall landings are made under certain water conditions, such as in a moderately rough sea, but they are hard on the aircraft. Floats are attached to the fuselage by a system of struts and braces. There is no provision for shock-absorbing gear such as oleo struts, and bungees. Most of the shock is transmitted to the aircraft itself. When you drop one, you'll know it!

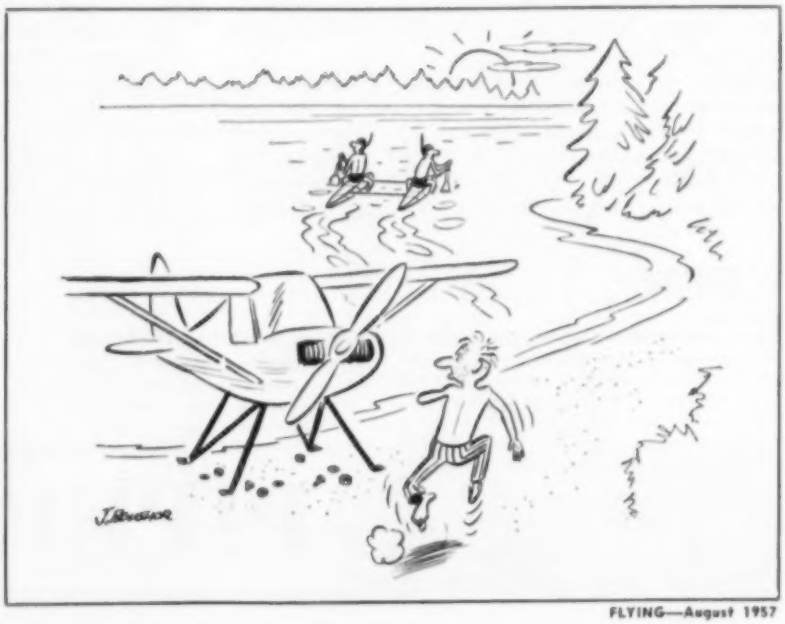
Glassy water makes accurate depth perception almost impossible. Under such conditions most seaplane pilots try to land along a shore where they may use trees, houses or other objects for reference. A power approach is the only way to make glassy water landings with safety. Making a nose-high approach with slightly less than cruise power will allow the aircraft to settle slowly toward the water in a landing attitude. The rate of descent is controlled with power. It is very effective. More than once I have flown for quite a time after I was certain I was just touching down.

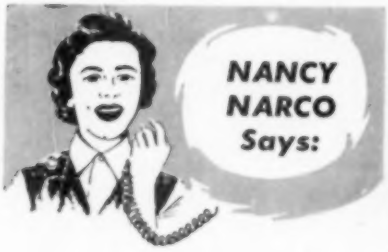
Crosswind landings in a seaplane can be made on one float. There is a point to remember, however. You do not crab a seaplane into the water. On land it is not a desirable situation; on water it is dangerous. It is not beyond reason that you may dig in a float and roll the aircraft over.

Landings can be made in water far too rough for take-off. Again the power stall technique is used, similar to glassy water procedure. The aircraft can actually be lowered into the water in this manner, and the point of touchdown accurately adjusted. The idea is to land along the crests. Frankly, I'd rather play around in sheltered waters.

Cross-wind taxi work is easy. Every seaplane I have flown had ample rudder to hold it in the desired direction in all but very high winds. Then again, in high winds you don't want to taxi. Here is a feature landlubbers like. Let's face it. There is little as frustrating as trying to taxi a mile or so with stops to clear runways, especially in a wind that you know down deep in your heart calls for wing walkers. On water, after landing, a seaplane decelerates at a rapid rate, and starts to turn into the wind as it slows. In a high wind, you just let it turn, and sail it wherever you want to go. That's right, I said *sail it*. The seaplane can be sailed in any direction on the water in a wind. Your direction and rate of travel is governed by the wind, power used and control forces. You can make an approach right over the place you want to

(Continued on page 68)





HAD A SERIOUS TALK with a bunch of senior-type control tower operators the other day. It started when I asked them what was the greatest single problem in their work. To my surprise—it was the little matter of receiver tuning.

THE MAN IN THE TOWER has a lot of facilities at his disposal, but they're not worth a thing when the little man who calls him for landing instructions doesn't have his receiver tuned to the right frequency. Usually, this guy calls and calls; he may get sore that the tower is apparently ignoring him. He may suspect that his transmitter isn't putting out, so he starts blowing and whistling and banging at his defenseless little mike. "Why," my tower friends ask, "don't they just tune their receivers to our frequency?"

LOTS OF REASONS WHY—all pretty silly. Out-of-date charts may show the wrong tower frequency—or, more likely, it's a case of improper tuning. So many people fail to allow for small tuning errors which are unavoidable in tunable receivers. Best thing is to tune to the tower while he's talking to someone else a few minutes before you have to call. If not, "rock" your tuning dial immediately after calling the tower until you hear him replying.

INCIDENTALLY, it would sure help if the tower boys would say their identification more frequently. Often you tune what you think is the tower you want only to find it's some other tower on an adjacent frequency.

OF COURSE, you people with crystal-controlled receivers have no problem. And the "whistle stop" introduced by Narco for positive crystal-calibrated tuning has made life simpler for thousands of Simplexer and Omnigator Mark II owners.

SOME DAY NARCO will catch up with its back orders on the new Omnigator Mark II, with "whistle stop" and all. Then you'll have yours, and you won't have to worry.

Regards,

Nancy

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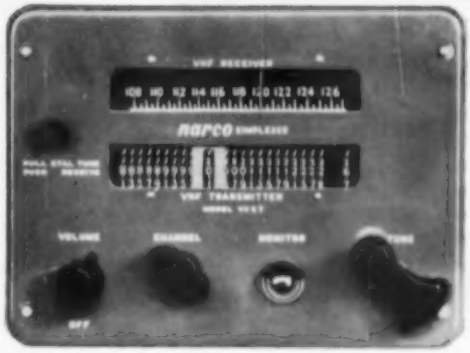
Need more frequencies?

. . . FOR BETTER TOWER, EN ROUTE AND DIRECT CENTER COMMUNICATIONS



Add the narco SIMPLEXER 27 CHANNEL VHF TRANSCEIVER

The Narco 27-channel Simplexer is business aviation's most popular communications transceiver. With its broad-band transmitter (118 to 126.7 mc) the Simplexer accommodates 27 crystals covering every channel needed for normal IFR operations. "Whistle-stop" feature gives quick, crystal-calibrated tuning for simplex transmission with center, tower or ATCS. Compact size permits convenient installation. Thousands of Simplexers are in daily use. Just the answer for that extra communications unit you need while working VOR or ILS.

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"Whistle-stop" feature provides positive, crystal-calibrated tuning of any VHF receiver in the airplane.

You'll enjoy the convenience of the extra 27 channels provided by either the Simplexer or VTA-3. Bring your communications up to date with one or both of these fine Narco units. See your Narco dealer or write for brochure.

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A Cessna 180 on Edo Amphibious Floats is proving invaluable to the Ashy Construction Co. of Eunice, La.

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"We use our amphibian flying to and from jobs located in marsh country that is readily accessible only by boat or plane. In one day we now cover an area that formerly took several days.

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EDO, WORLD'S LEADING MANUFACTURER OF AIRCRAFT FLOATS, makes a complete line of standard and amphibious floats for many types of airplanes.

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(Continued from page 66)

dock and sail directly back to it. Let's sail one!

Once the aircraft, now a seacraft, has landed and slowed down, you can do either of two things. If the wind isn't high, you can make a water turn and taxi downwind to the dock. If you are getting much more than wavelets, it's a pretty bouncy ride, especially if you try to hurry and start taxiing on the step. Assuming there is sufficient wind to make you hesitate at water turns and downwind taxiing (I say hesitate for again it is a question of technique, equipment, and above all pilot ability) you can let the plane weathervane and then, by judicious use of power and control, make it move forward or backward, right or left or any combination thereof. Your seaplane is equipped with a water rudder mounted on the stern of the floats or on the bottom of the hull, whichever the case may be. It is retracted for take-offs and landings, but is a terrific help in surface maneuvering. It takes a lot of experience to be able to handle a seaplane without one. With a little practice, one can get amazingly accurate in sailing.

I have seen Phil back into a slip from 200 yards out, and off to one side at 45 degrees. That may not sound difficult unless you happen to know that the slip is two feet wider than the float span!

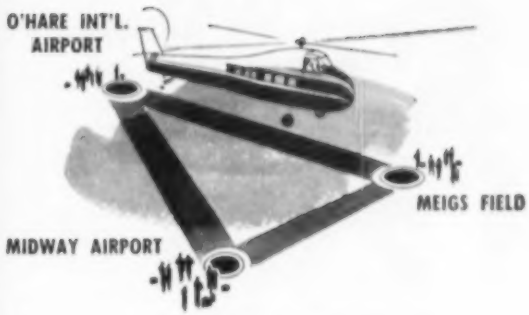
I have found whole new worlds open to the seaplane pilot that landlubber types never see. If you are a fisherman or hunter, here is the vehicle for you. A seaplane is the greatest for touring much of the country not otherwise accessible. One can make a cross-country from coast to coast and never be too far from water. Then again, if one has to, he can land a float plane on solid ground, and take off again without tearing up the floats. I have never seen a float plane nosed over landing on dry land. Perhaps there have been many, but I suspect they have been a vast minority in relation to the actual number of landings made.

The new Amphibian float by Edo will do wonders for the float flying business, for now even your small aircraft have amphibious features. Seaplanes aren't as rare as they first appear to be, either. There are lots of them around. Almost any light aircraft will convert with very little work and the outlay for the floats is little compared to the fun derived. If you want flying boat types, there are some mighty good ones—used and brand new—as witness the cover of this issue of FLYING.

If you are tired of the scenery around the local airport or are looking for something different; if you are thinking of taking up flying or buying a plane; if you are just plain thinking, why not drop into your local seaplane base and look around. You'll like what you see. There is an air of comradeship around most seaplane bases reminiscent of the days when the private pilot and the lightplane owner were the bread and butter of the airport manager. Who knows, you may find a new home. Of course, I'm prejudiced. Like the title says—"Me, I'll take seaplanes." END

CHICAGO HELICOPTER AIRWAYS

reduces travel time 80% over Chicago's "Triangle of Terminals"



...with CYCLONE 9 powered SIKORSKY S-58 helicopters

Chicago's airports – Midway and O'Hare – are approximately 16 air miles apart. To cover the distance between them by cab takes an hour or more in average traffic. But to travel these miles by Chicago Helicopter Airways takes just 12 minutes – and costs less. Air travelers have been taking full advantage of this fast, dependable service, and of CHA's other suburban passenger and mail schedules, since their inception.

On April 1 this year, the airline expanded its service to include Meigs Field – speeding connections over the triangle of airport and midtown terminals. For this schedule – a long-sought goal –Chicago Helicopter Airways selected big Sikorsky S-58 helicopters, powered by Curtiss-Wright Cyclone 9 engines.

In other cities of the U. S. and the world, as in Chicago, Cyclone 9 power has solved the problems of metropolitan inter-airport and "downtown" travel. The Cyclone 9 is a powerful answer to many special problems and use-requirements in modern aircraft, both civil and military – including transports, patrol and rescue aircraft, sub-hunters and trainers, as well as advanced design helicopters.

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SAVE TWO PRECIOUS YEARS

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Veterans: Check here ☐ for Special Veteran Training Information.

Transition to Twins

(Continued from page 25)

information.

Following a detailed discussion of the operating limits of engines and airframe, we move to the airplane for a careful preflight inspection—checking propellers for nicks and abrasions; locating and draining fuel pumps; noting tires for cuts and proper inflation; and checking the cowlings for security and signs of oil leakage.

After completing the pre-flight, we enter the cockpit and spend considerable time on familiarization with the features of the cabin, instrument panel, control pedestal, fuel system controls, electrical system, hydraulic system, emergency gear extension procedure, and cabin heating and ventilating controls. When the pilot is familiar with the location of controls, and has grasped the operation of the various systems, we complete the "Before Engine Start" check list.

Next the owner starts the engines, using the "Starting Engines" check list and, while the engines are warming up, we demonstrate how the bulbs in the "Gear Down" warning lights may be interchanged to provide indication should one burn out in flight. Then we turn on the navigation lights and again check the gear warning lights (they automatically dim when the navigation lights are on) as this may prevent a new pilot declaring an emergency should the navigation lights be inadvertently left on during daylight flight. We also demonstrate proper operation of the hydraulic hand pump because there have been occasions when the telescoping handle has been mistaken for a plunger type pump. The final items on the "Engine Run-Up" check list emphasize the necessity of exercising the propellers into feathering position (two or three times in cold weather) to assure warm oil in the domes for proper operation in flight.

As soon as the new owner has completed the "Before Take-off" check list, he gets clearance, and taxis into position on the runway. Before beginning actual take-off, he is cautioned to pre-plan what action he would take in the event of power loss during take-off. The Apache take-off is spectacular, but we caution, "Check your airspeed indicator; have at least 70 mph indicated before you pull off the ground." In case of an engine failure below 85 mph (minimum single engine speed) it will be necessary to reduce power on the live engine to maintain directional control. On breaking clear of the ground, level off and let the airspeed build up to 95 mph (best single engine climb speed). Do not rush retraction of gear on take-off, since if engine failure occurs with available runway left for landing, the pilot should *always land!*

During climb-out, the owner's attention is drawn to the importance of maintaining 100 mph (best rate-of-climb) to obtain altitude as quickly and safely as possible because, should power failure occur, the extra altitude would be of greater value than excessive airspeed in effecting a safe return for landing.

The climb is continued to optimum cruising altitude (6,000 ft.) where the plane is trimmed for level hands-off flight. By the use of Pressure Altitude, Outside Air Temperature, Indicated Airspeed readings and the flight calculator, we compute the true airspeed for the particular weight configuration of this flight. I find that it is particularly helpful at this point to explain, and demonstrate, the operation of radio gear for navigation and communications; radio controls which permit selection of either loud-

(Continued on page 72)

BUSINESS BRANDS

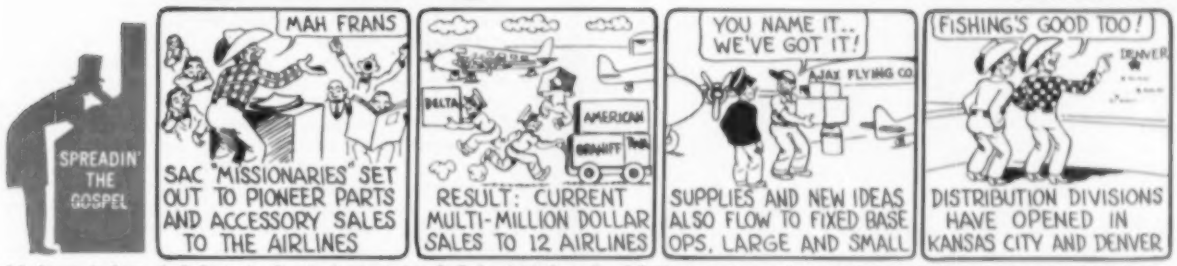
CLINTON MACHINE COMPANY of Clinton, Mich. and Maquoketa, Iowa, uses two Piper Apaches in transporting executive and sales personnel and speedy service for customers. Based at Tecumseh, Mich. and Davenport, Iowa, both planes fly regularly in and out of the small sod field at the Maquoketa plant. Last year alone, Pilots Otis R. Leist and Claire Wertz (shown here) each flew 1,000 hours, VFR and IFR.

Manufacturers of small engines for industrial use, Clinton Machine bought its first Apache in 1954. Since that time 4,600 hours have been logged by the original aircraft and its two successors on interplant missions and other flights.

Company officials and the pilots both agree that their aircraft are economical to operate and that twin engines make for dependability and safety in busy flight schedules.

SAC Silver Jubilee Newsreel

BY JACK PATTON


SPREADIN' THE GOSPEL
MAH FRANS
SAC "MISSIONARIES" SET OUT TO PIONEER PARTS AND ACCESSORY SALES TO THE AIRLINES
DELTA
AMERICAN
RESULT: CURRENT MULTI-MILLION DOLLAR SALES TO 12 AIRLINES
YOU NAME IT.. WE'VE GOT IT!
AJAX FLYING CO.
SUPPLIES AND NEW IDEAS ALSO FLOW TO FIXED BASE OPS, LARGE AND SMALL
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DISTRIBUTION DIVISIONS HAVE OPENED IN KANSAS CITY AND DENVER

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Southwest Airmotive not only has pioneered many vital equipment-sales concepts, it also has done much to open the industry's eyes to a proud meaning and a new dignity in the word "distributor." The firm's role in worthy industry affairs is legendary, dating 'way back to such things as this SAC-sponsored WW II aeronautical tent-show.

Grimes Mfg. Co., Hamilton Standard, Lycoming, Montrose Div. (Bendix), New York Air Brake, Pacific Div. (Bendix), Packard Electric, Pesco

Set to move in the fall into its new home—the former City of Dallas airline terminal (immediate right)—SAC's distribution division is one of aviation's finest sales forces. VP Paul Kennedy, "head coach" of a fiercely loyal team, is shown in the inset photo presenting a service award to Bob Jackson, Midwest Division manager.

Pioneer Central Div. (Bendix), Pratt & Whitney Aircraft, Red Bank Div. (Bendix), Scintilla, Skinner Div. (Bendix), Utica Div. (Bendix), and Willard Batteries

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Guaranteed superior to original, up to six pounds *lighter*, these heavy-duty leatherette fabric covered SEAT CUSHIONS are *complete* replacement sets for *all* seats including back-rests and bottoms.

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Aeronca Chief (State Yr. of mfg.)	23.25
Cessna 120-140	32.50
Ercoupe	35.25
Luscombe 8A—8E	33.75
Piper J-3, PA-11, PA-18	21.50
Piper J-5, PA-12	34.50
Taylorcraft—side by side	23.25

Others on request
Specify colors: Black, Brown, Green, Gray, Red and Blue. (Cream trim $5.00 extra.)

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Complete with all necessary zippers, stiffeners and attaching means, etc. Ready to install! All popular colors.

Aeronca Champ	$16.80
Aeronca Chief	17.50
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Stinson 150-165	20.25
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Others on request

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Exquisite colors, deep pile. The finest woven rubber backed carpets, tailored to fit. Snaps included.

Aeronca Champ	$14.25
Aeronca Chief	7.50
Beech 17	28.00
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Ercoupe	9.00
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Piper J-3, PA-11, PA-18, J-5, PA-12	14.50
Piper Clipper, Pacer, Tri-Pacer	15.50
Stinson 10-A, 105	15.25
Stinson 108 Series	15.75
Taylorcraft, side by side	8.75

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(Continued from page 70)

speaker or headphone reception; and the circuit breakers which control the radio system.

Familiarization with slow flight and stall characteristics are thoroughly covered before the descent and landing practice.

Next on the agenda is a demonstration of the steep angle of descent possible with gear and flaps extended. This is always impressive to a new owner. The use of this maneuver makes it possible to lose altitude quickly during an approach, without building up excessive airspeed. This steep approach, made possible by the constant speed propellers and 50 degrees flap setting, is a real safety factor for night landings at strange airports where unknown obstructions may exist on the approach path. The flight is continued to the airport, and a series of take-offs and landings are made to familiarize the pilot with the plane's flexibility of operation and handling ease.

At Piper, we place particular emphasis on a thorough indoctrination in single engine operation; and give the new owner many opportunities to repeat all maneuvers until he acquires complete confidence in the plane and in his ability to cope with engine-out operation.

Initial single-engine practice is started at cruising altitude with the airplane trimmed for level flight. The left (critical) engine is throttled back, the propeller feathered, the mixture put in idle-cutoff, and the ignition switched off; the plane is then trimmed for hands-off flight, with a couple of degrees bank toward the "good" engine. Medium turns are made both toward and away from the dead engine to demonstrate the plane's complete maneuverability on one engine. Here is stressed the desirability of planning every single-engine approach so all turns are made into the "good" engine, if possible.

With the engine still feathered, the owner is instructed to increase the angle of attack slowly until the airspeed reaches 90 mph. Control response and flight characteristics are pointed out and discussed; then we have him further increase his climb, allowing the airspeed to drop to stalling, the owner being instructed to keep directional control at the stall by reducing power on the good engine. Attention is drawn to the unmistakable buffet which occurs at three to five mph above the stall, which, in effect, is a stall-warning indicator and instills a great deal of confidence in the pilot.

To further familiarize the pilot with his plane, we have him execute a full-throttle, single-engine climb for three minutes at approximately 95 mph, to determine the best rate-of-climb for his particular aircraft. Individual airspeeds vary slightly in indicated readings of maximum single-engine climb. After leveling-out at our new altitude, the owner is told to lower the gear so as to determine its effect on single-engine flight characteristics. Since the left engine provides hydraulic power for gear and flap operation, the gear will not extend by itself. Here, we generally wait patiently for the owner to figure out that he must extend the gear manually by use of the hand pump. This procedure firmly fixes the operation in his mind. After discussion of the manual gear extension procedure, and noting its effect on flight, we have the owner extend the flaps in a similar manner to note their effect on operation and performance.

The dead engine is now restarted, with the sequence of control carried out in the reverse order from that used in

NEXT MONTH IN FLYING

CHECK PILOT REPORT ON THE AEROCAR

Its builders feel that the weather problem is licked with this airplane. You land and drive through a storm area, then take off on the other side. Alice Fuchs, well known aviation writer and pilot, reports on the unusual aircraft.

feathering. Before starting, I always emphasize the need for care in throttle operation. The throttle should be opened about ⅛" (never over ¼"). This is important to prevent excessive engine "shake" in starting. As the starter is engaged and the engine fires, the throttle must immediately be closed to permit the engine to idle smoothly out of feather position. The engine is allowed to warm up to operating temperatures. As soon as it is again in full operation, the owner is asked to put the plane in a full-power climb at 85 mph (minimum single-engine speed).

When the pilot has definitely established his full-power climb, we pull the power off one engine to emphasize the control force necessary to maintain heading when an engine fails. Following this, the pilot is permitted to restart the engine and reapply full power, but only after he has demonstrated his ability to identify the dead engine and take corrective action to feather it and trim for level flight.

With both engines operating, the pilot is now asked to climb to a specific altitude, level off, and make a 180° turn. Being rather proud of his accomplishments he levels off at the required altitude, and begins his turn. While he is thus occupied, we shut off the fuel to one of the engines, and shortly thereafter the pilot is faced with his first actual engine failure. Where practicable I cut the fuel to the engine by which he has had least feathering practice so, if he has acquired merely mechanical reactions to single-engine emergencies, he may be in for a rude awakening. (If he takes corrective action on the "good" engine, the silence is quite deafening.) I find that most pilots benefit greatly from this kind of "unexpected" emergency practice.

Now we return to the airport for a single-engine approach and landing. We caution on the necessity of planning approach so as to avoid undershooting because of the difficulty of "going around" with the gear and flaps extended. It is preferable to plan the approach in such a manner that flaps are applied only in the last few hundred feet from the runway at which time no question should exist about the landing. The tendency for new twin-pilots is to approach with excessive airspeed. This leads to overshooting.

The target in transition training is to give a new owner sufficient experience with his new plane to competently handle it under all conditions. All maneuvers in the syllabus are repeated as often as necessary to accomplish this result. The pilot's satisfaction in completing the course lies in the knowledge that, should he experience an engine or hydraulic system failure in flight, he will have the ability and confidence to cope adequately with the emergency. I recommend to each pilot that the procedures and maneuvers be simulated and practiced whenever opportunity arises, so that his proficiency will improve rather than deteriorate. One who fully understands and respects the capabilities of his aircraft will recall with pride and joy the day when he became a twin-engine pilot. END

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DISPOSABLE, PLASTIC PASSENGER MASKS

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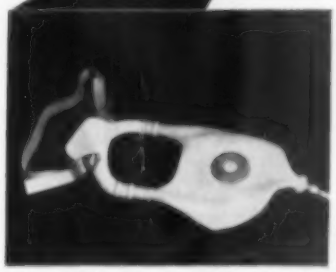
Passengers have a right to expect comfort and pleasing appearance in an oxygen mask. The Puritan disposable mask — originally developed to meet rigid hospital requirements—has many advantages to offer. The polyethylene nose piece fits the face comfortably and is easily adjusted to each individual. These complete, light-weight masks come individually packed and can be thrown away after use (no bothersome sterilizing). The Puritan disposable mask answers your passenger desire for comfort and convenience . . . answers your problem of a low cost unit.

Priced at only $1.00 each F.O.B. Kansas City (lower unit cost in larger quantity) No. 114011.



Ask any pilot or crew member what he wants in an oxygen mask. Chances are he'll say, "comfort, coolness and easy breathing." Here is the mask that gives all of these advantages. The Puritan No. 114000 nasal oxygen mask. A constant flow, rebreathing type mask with a comfortable fitting plastic nose piece and latex rubber bag. The nose piece is arranged to provide a perfect air flow in and out of the bag so that respiratory effort is minimized and mask is cooled for further comfort.

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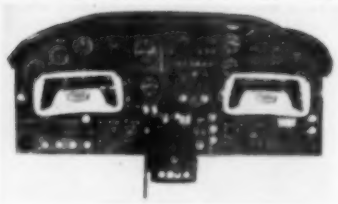

Retaining the same outward appearance and power units as previous models, the 1957 version of Cessna's light twin has many improvements and additions designed especially for pilot efficiency and passenger comfort. The principal changes are: reduction of noise level, new seating arrangements, newly designed instrument panel and lighting system, double retractable step, equipment revision, exterior and interior styling. Sound level in the 310B has been substantially lowered by increasing the thickness of cabin windows and windshield to one-quarter inch, and addition of sound proofing material. The three-passenger rear seat reclines two inches further back and has detachable arm rests. As optional equipment, airline-type individual seats are available at extra cost. One of the outstanding new features is the completely new instrument panel. Finished in black, it has all the navigation and communication equipment relocated in the center, while optional accessories are placed for more functional usage. The new panel provides a more convenient grouping of instruments, switches and radio for greater efficiency during IFR en route and approach conditions.

(Continued from page 62)

were required to clear the fog sufficiently to receive aircraft.

Assuming that fuel cost 20 cents an imperial gallon, on a normal runway it would cost about $5,000 for the heating period, and over $1,000 for each landing. On the big emergency runways where the rate of fuel burned was close to 4,000 gallons *per minute*, the cost was approximately three times as much—enormous—but not too high a price for the saving of life and planes.

FIDO installation often saved lost pilots. On one occasion it lit at St. Eval Coastal Command station in Cornwall for aircraft take-off on an anti-submarine patrol. The pilot of a lost Lysander, whose radio was dead, suddenly saw the glare of FIDO. But just as he sat down, the burners were turned off. A minute after landing, he was completely lost in a thick fog, and since Flying Control did not know of his arrival, he groped for two hours afoot to locate the control tower. On another occasion, five Lancasters landed and, when FIDO was extinguished, the crews could not find their barracks and had to spend the night in the hangar.

American fliers, one foggy afternoon, landed 91 bombers, mostly Fortresses, at the emergency runway at Woodbridge, coming in at less than two minute intervals.

The Germans naturally were puzzled when they found RAF bombers night after night over their homeland, although briefed by their weather men that fog enveloped the British Isles. They had arrived at no solution to the enigma by the time of the Battle of the Bulge. Impossible flying weather still seemed the key to their best chance of success. They started the attack in December and, by Christmas Eve, the fog had spread over the whole area, causing great disorder in our front line. The Allied army needed immediate air assistance. RAF Pathfinders took off with FIDO, marked their targets with flares—seven marshalling yards, two airfields in the Ruhr, and the important enemy supply base at St. Vith. The attack on St. Vith took place in one of the worst fogs of the year. After the marking, from all over England wave after wave of Lancasters blasted the targets.

On May 5, 1945, Field Marshal von Rundstedt said, "The object of the Ardennes offensive was to relieve pressure, take Liege and hold the line of the Meuse. Allied strategic bombing of supply lines caused the failure of the push. Hitler ordered the Ardennes Offensive, Germany's only chance of averting defeat."

And so FIDO paid off.

Today there is but a single FIDO left in England, on the outsize runway at Manston. Although this is an Air Force station, this particular aid is also available for civil aircraft in emergency. At one time a FIDO for the London Airport was considered. Airlines were asked to contribute to its construction and maintenance on a pool basis, but nothing came of the idea. The comforting fact remains, however, that if every airport in Europe should be fogged in, Manston is available night and day to receive aircraft unable to get down elsewhere. END

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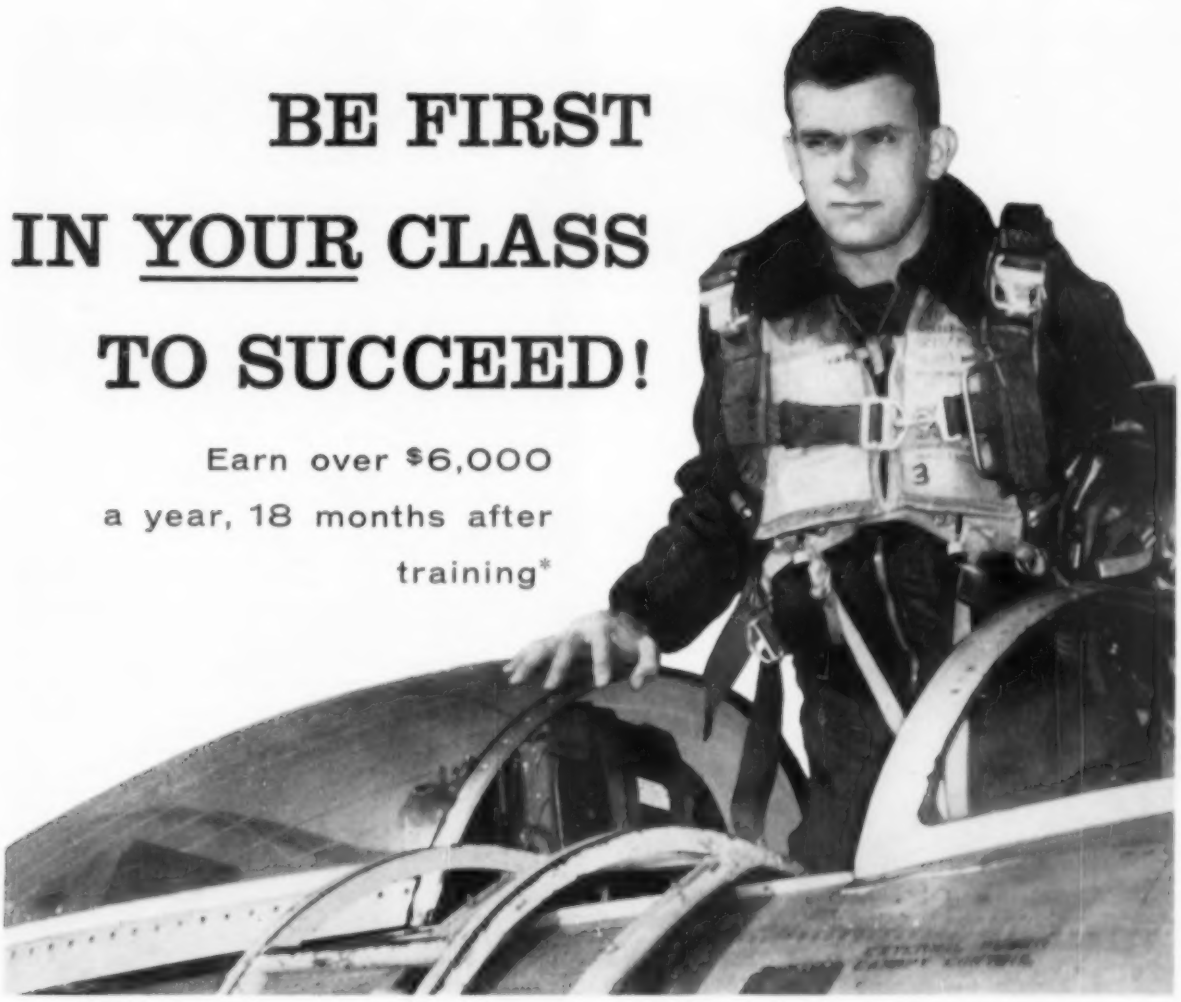

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AIRCRAFT OWNERS AND PILOTS ASSOCIATION

AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is "To make flying more useful, less expensive, safer and more fun."

Headquarters address is Box 5960, Washington 14, D.C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING Magazine.

RADIO CHANNELS STUDIED

At AOPA's request, the Civil Aeronautics Administration is gathering precise statistics on the use of 3023.5 kc for radio communications by civil aircraft before taking steps to diminish service on that frequency.

Last spring when CAA informed AOPA that the usefulness of the medium wave frequency was under study, Victor J. Kayne, the Association's air traffic control consultant, informed the Federal agency that AOPA records showed that 9.3% of the general civil aircraft were equipped to transmit only on that frequency. AOPA urged CAA to make certain that airplanes with such equipment would not be deprived of radio service at CAA towers and communications stations.

CAA then requested all of its regional administrators to require all control towers, Airways Traffic Communications Stations, and communications stations/towers to keep records of contacts made with the installations by aircraft on the 3023.5 kc frequency during a one-month period. The future of this channel as an aviation frequency is expected to depend largely upon the results of the CAA survey.

AOPA also is urging CAA to go slowly in discontinuing low frequency service, but is encouraging its members to convert to very high frequency (VHF) transmitters when changes are made in their aircraft radio installations. Decommissioning of the low frequency ranges (L/MF) and communications stations has been a live issue since about 1950, when widespread use of omni and other VHF facilities by general civil aircraft was becoming a reality. AOPA took a strong position against reducing the low frequency coverage until comparable coverage was available from the omni network and conversion to VHF equipment in private and business aircraft had been accomplished.

An AOPA Pilot Poll survey made in 1956 indicated that 22.3% of the airplanes in the general aircraft category were equipped only with low frequency receivers, although some of the aircraft equipped only with low frequency retransmit on VHF channels.

When CAA issued formal notice to airmen that low frequency communications at New York's Idlewild Airport would be discontinued on June 28, AOPA again called the agency's attention to the need for this service by many pilots.

CAA's action in discontinuing the low frequency voice transmission at New York's Idlewild Airport appeared to AOPA to be an indication of the agency's thinking in regard to L/MF service. AOPA requested that further decommissionings be held up until the need for the service had passed.

REGIONAL FLIGHT

Arrangements are being made to hold one AOPA regional flight this year. It will be at the Edgewater Gulf Hotel, Edgewater Park, Miss., on the weekend of Oct. 4-6. The luxurious Edgewater Gulf was the scene of last year's greatly enjoyed "Mississippi Flight."

Decision to hold the "Plantation Party Flight" at Edgewater Park was made after numerous requests were received from participants of last year's fly-in (and others who couldn't make it, but heard about the fine time they missed) that a "return engagement" be held at the Mississippi resort. Plans are being made to accommodate a much larger group than attended the 1956 affair. Edgewater Gulf officials already have started making plans to assure the AOPA contingent of an enjoyable weekend.

A highlight of the weekend on the Gulf of Mexico coast will be the "Plantation Party" Saturday evening, October 5. Last year, a "hot" Dixieland jazz orchestra was imported from nearby New Orleans for the occasion. That feature of the program will be repeated this year.

Reservations for the flight now are being received by AOPA Headquarters. Special arrangements are being made for AOPA members and their guests living in the Gulfport-Biloxi area, and other nearby Mississippi and Louisiana points, to participate in the flight although they do not spend the weekend at the hotel. Invitations are being extended to them to attend the Plantation Party, particularly. Further information on the October event may be obtained by writing A. H. Frisch, AOPA Headquarters, Box 5960, Washington 14, D. C. The cost of the weekend stay at Edgewater Park, will be less than last year.

The AOPA'ers and their parties will fly their airplanes to Gulfport Municipal airport as they did last year. Transportation will be provided from the airport to the hotel, three miles away.

CONTEST EXTENDED

Closing date of the 1957 AOPA Membership Contest has been changed from September 16 to October 15.

Moving the termination date ahead one month came after a printing delay prevented literature on the contest from reaching all AOPA'ers on time.

AOPA officials are pleased with the interest shown thus far in the contest, in which a 1957 Champion *Tri-Traveler*, and a 15-foot *Spartan Sprite* motorboat, and two Narco radios will be the top prizes. The airplane will go to the new member who submits the best 25-word statement on why he joined AOPA. The motorboat Narco *Omnigator Mark II* and Narco *Simplexer* will go to the "old" members submitting the three best safety slogans. Each member is entitled to enter one safety slogan for each new membership he obtains.

One of the busiest places at AOPA National Headquarters is the Production and Mailing department, shown above. In producing the monthly AOPA Confidential Newsletter, Safety Service Bulletins, Special Reports, and other informational materials sent to the 65,000 AOPA members and other flyers, about eight million impressions are printed annually. The mailing section dispatches approximately two and one-half million pieces of mail during a year.

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- Ignition suppressor permits operation with unshielded ignitions (Saves up to $100 on installation costs)
- Noise squelch control • Two headset jacks
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Plugs in any wall socket. Features built-in antenna, 5" speaker and headset jack. Comes complete ready to operate.

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PLUGS INTO ANY WALL SOCKET — 115 v. AC, 35 watts **(export shipments** furnished with 220 v. 50 or 60 cycles on request), compact ebony case, black crackle control panel with white dial calibrations, 7½" x 5" x 4½", weight: 5 lbs., shipped hermetically sealed in plastic with shock-proof carton.

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The Paul Bunyan Clan

(Continued from page 57)

originated in 1940 by his faithful disciples in the Traverse City Chamber of Commerce aided and abetted by Col. Floyd Evans, then director of the Michigan Department of Aeronautics and Bruce Anderson, Lansing hotel manager. By-laws of the Clan were patterned after the Alligator Club of Orlando, Fla. The Bunyan devotees met for the first time on July 27, 1940. At this meeting it was decided to abandon formality. Therefore, only one officer was elected—a camp clerk, the job held in Paul's time by Johnny Inkslinger. Bruce Anderson was the unanimous choice. In 1941 the Clan initiated 92 new members.

World War II curtailed the activity of the Clan as most of the pilots went into service. Those too old to join the Air Force or unqualified to teach flying, joined Civil Air Patrol. After the war the Clan was reactivated (1948) with a bigger-than-ever celebration.

Each fall now the Clan members prepare the rocky tote road for the initiation ceremony. After a meal of planked lake trout, the candidates are readied for their journey. Before entering the trail to "big Paul's" camp, the prospective member is examined by Paul's personal doctor. Physical condition must be good enough to stand the rigors of the journey without risk of permanent disability.

Most of the initiation is secret and is changed from year to year, but always ends with a big kiss for Babe, the blue ox. What's in between the doctor and the ox cannot be told, but it is guaranteed to be fun. Many famous people have embraced Babe. "Miss Michigan" went over the trail in 1956. At this writing over 1,000 pilots and many associated friends belong to the fun-loving Paul Bunyan Clan.

The Traverse City Airport has progressed along with the Clan, maybe even faster. The first Clan meeting found a field about a mile square with 3,600 feet of usable runway. There were no paved strips or ramps. One small hangar housed five aircraft and the manager's office. Today the Traverse City Paul Bunyan Airport has four hard-surface runways over 5,000 feet long. There is adequate housing for private planes on the field and the main hangar will shelter any transient aircraft which may desire inside parking.

Not counting airlines, military aircraft, or fly-ins, over 3,000 aircraft stopped over night last year. Over 20,000 take-offs and landings were made at the field in 1956.

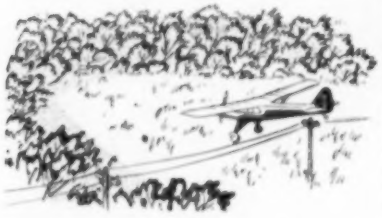
The future holds a lot of promise for the Paul Bunyan Clan. The biggest meeting yet will be in 1957! The scenic beauty of the region will be at its peak. The lakes and streams will be filled with fresh clear water, and the trees will have their first fringe of autumn color. The Clan will be out in full force with a group of new members to brave the rugged initiation.

Sponsors of the Clan hope that you will be among the flyers present, October 4th, 5th, and 6th, 1957, when the Clan gathers again. As an old member back for a good time or as a neophyte prepared to walk the dark, slippery, log trail to "Big Paul's" camp, you are sure to have fun. END

Hangar Flying

(Continued from page 18)

was gassed, ! grabbed my winter flight jacket from the car and we rushed out to the flight line. The air was smooth, with just an occasional gust from the 20-30 mph wind and the temperature was dropping rapidly. Ceiling was ample for our low altitude work and the visibility fair, though haze and smoky sky indicated high moisture content. After leaving traffic we concentrated on steep and medium pylon-eights and S-turns. When I felt that Hank had them down pat, I told him to return to the field and shoot a few precision landings. While in the turn, I pulled the carburetor heat, chopped the throttle on Hank and called, "forced landing." The prop did not turn more than three revolutions when it stopped dead. Instinctively I hit the throttle and pushed the nose down, but the engine was beyond



help. Full realization of complete power failure at an altitude less than 500 feet hit me when Hank generously turned the controls over to me.

The only opening upwind was a small clearing surrounded by trees on three sides and an R.E. line stretching directly across our path. I had no choice. I turned directly toward the opening and concentrated on the approach. With no hope of making the field, I dived on the copper line and at the last possible moment horsed back on the stick, ballooned over the wires and plunked the plane into the opening. It hit, bounced off a terrace and rolled to a stop.

The outside of the carburetor was dripping with water. Obviously, it was the old "bug-a-boo," *carburetor ice.*

GUY DAVIS

Bryan, Tex.

SWITCH OFF

EVERYBODY IN FLYING has "one for the book." Listen to my story because I have learned my lesson and will feel better if its moral is passed on to others. It proves what professionals like Joe Duckworth (author of "You and Instruments") and the University of Illinois (180 degree turn) have been preaching.

One day last year found me in San Francisco with its typical morning weather, low ceiling, overcast sky, but expected to burn off in several hours. I wanted to go to Merced, where it was clear It was also clear just beyond the hills on the other side of the Bay. According to PIREPS, the layer overhead was only 1,000 feet thick, but the hilltops were in the clouds.

(Continued on page 80)

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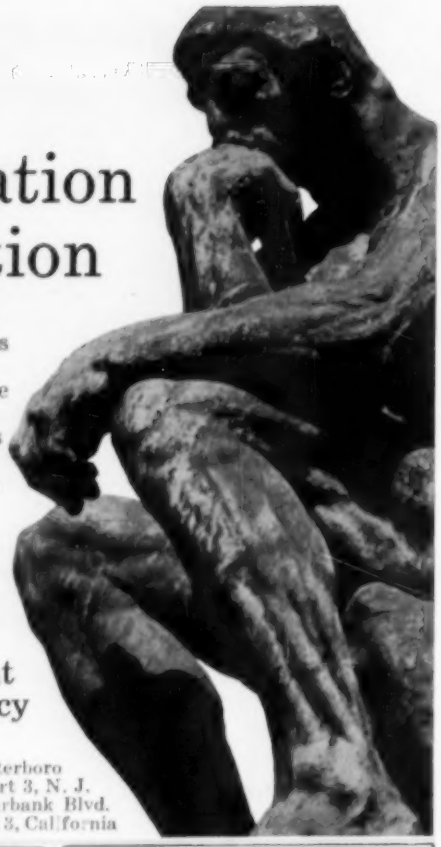

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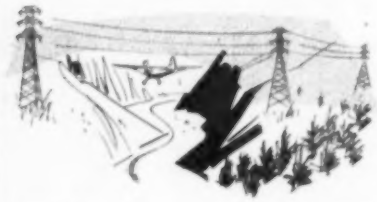
Hangar Flying

(Continued from page 79)

In my trips around the country I have consistently followed the practice of consulting the S.L.P.'s (Senior Local Pilots), familiar with local terrain and weather.

While waiting for the ceiling to lift, I talked to an S.L.P. who, according to operations people, had flown in and out of the San Francisco area every day for the past 25 years. I asked him what he would do if he wanted to go to Merced and was not an instrument pilot. The gist of his advice was: "No sweat, just follow the western edge of the bay to the bridge at Palo Alto, then across the eastern edge through the Niles-Livermore pass which is always open, etc." So we rechecked the weather, did a little map studying, and I took off.



The initial portion of the flight, south to the bridge and east across the bay was uneventful. Over Niles (just west of the pass and the hills) ceiling appeared to be between 700 and 1,000 feet with lowering visibility. Here I made what could, or rather should, have been a fatal mistake. Since clear weather was indicated "just ahead" and the S.L.P. said the pass was always open, I elected to go on for a look. I got into the pass, noted that the hilltops were still in the clouds and involuntarily climbed a bit. Suddenly, out of the corner of my eye I caught a silvery flash and jerking my head around, I saw that we had barely missed a high tension line strung from one summit to another. To add to my consternation, the pass was tightening up. I could see the railroad tracks doubling back, and nothing beyond. There was not sufficient space to do a 180 turn. I pulled up into the overcast. Now, I read all this literature on weather flying advice to non-instrument pilots, so I started talking to myself: "Don't panic, hands off, don't overcontrol, let the airplane's inherent stability take over, easy on the rudder pedals. Keep the Turn Indicator's needle centered." After a few minutes which seemed like several lifetimes, I broke through on top into brilliant sunshine, said a prayer aloud and grabbed for a cigarette.

But this is not the end of my tale. As soon as I calmed down I proceeded to scan the instrument panel. It was then that my eyes caught something of interest, different on this plane from the others in our club, the turn and bank indicator was equipped with a switch. But what brought cold sweat to my forehead was the position of the switch. It was "OFF."

Offutt AFB, Nebr. — JACK BESTIC

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The Long Shadow of ARC

(Continued from page 35)

perfected in dependability for civil aircraft, where weight and space are vital, the long years of pioneering research in military communications laid foundations of high skill and broad experience.

Shortly after WW I, radio broadcasting began to sweep the country. Some businessmen who were interested in the electrical characteristics of molded materials employed an outstanding young radio engineer, Dr. Lewis M. Hull, to guide their research along this line. Hull and his confreres had to devise electronic innovations for test purposes. Soon the radio industry was deluging them with technological problems. This attracted a cadre of electronic geniuses and in 1922 the famed Radio Frequency Laboratories came into being. Its developments were patented and licensed to some of the most famous of radio firms—Stromberg-Carlson, Crosley, DeForest of Canada, American Bosch, Kellogg Switchboard, Sangamo, Grigsby-Grunow and others.

Out of broadcasting grew the idea of radio to meet other needs—one of these being the need of pilots for a system of navigational signals. The U. S. Bureau of Lighthouses proposed a "radio beacon" to emit signals very much as a lighthouse furnishes visual guidance. To probe this and other possibilities, Radio Frequency Laboratories had set up an Aircraft Division and in 1927 the division, which later became Aircraft Radio Corporation, set about the task.

In those days, the Bureau of Air Commerce had just been established. There were no great airports; no scheduled airlines in the modern sense; no established airways. Some of the larger military aircraft were supposed to have radio intercommunications, but no pilot would depend on them. ARC could see that any genuinely fruitful application of radio to aviation must tie up laboratory research with flight activity. Out of this realization grew the laboratory, manufacturing plant, hangars, and the Boonton airport itself. For many years this installation was literally the only non-government establishment in the country which integrated radio research and development with aircraft operation and maintenance.

Just prior to WW II, ARC climaxed development of an improved line of airborne radio equipment. Various functional combinations of this new line were ordered in increasing quantities by government. In line with Army and Navy policies in respect to a second source of supply for vital equipment, the company furnished drawings, specifications, and engineering assistance to Western Electric which gradually assumed the burden of supplying, as prime contractor, all Army requirements for the articles. Later the Stromberg-Carlson Company assumed the same status in relation to an important part of Navy requirements. This equipment, first introduced to the services as "Aircraft Radio Corporation Type K," was christened "SCR-274-N" by Army and "AN/ARC-5" by Navy.

Throughout its history until 1945, ARC primarily specialized in development and test of airborne electronic equipment to

meet military requirements. Military specifications were principally written around the company's products, and ARC remained the sole supplier of many of them. After WW II, a sharp recession ensued in military buying. Additionally, the civilian market became flooded with war-surplus material. Now therefore, while ARC continued work on special military requests, the company began to produce electronic test equipment, mostly in the ultra-high-frequency and micro-wave fields; and to cater to the civil aviation market for the most modern radio communication and navigation aids.

The bulk of its engineering and promotional effort, during 1946-8, was in designs suited to the operational needs of civilian aircraft. Financial losses were sustained in this process because the company's experience dictated rejection of sale of its products as "package goods." Establishment of a network of qualified field outlets required several years of selection and indoctrination. But the patience to refuse compromise paid off both economically and in reputation.

Examination of the design doctrine of ARC reveals the company's long range conclusion that, regardless of the complexity of the function of a piece of airborne equipment, its design must be refined down to the last word in structural simplicity. This is time consuming and attainable only by use of high grade materials and ingenious workmanship, but it pays major dividends in ease of maintenance and reliability. Incidentally, it also largely bars use of mass produced components from jobbing sources. I credit the long experience of the company in service testing its products in its own aircraft as responsible for this zeal in structural simplicity. Also automation is considered less desirable than reliability.

ARC's concentration on miniaturized dual aids for such aircraft as light twins and various business and private types was a fortunate development for the military services when Korea demanded intense utilization of these types for liaison and observation work. Happily the company was tooled for quantity production to serve its civil market when this crisis arose, and because it had previously been so long in the military field its equipment met military specifications.

Thus once again, as in the originating of the first airway facilities and in the subsequent designing of dependable radio for the nation's air defense forces, the sturdy pioneer of air age communications, served a purpose which marks it as high on the honor roll of those in free enterprise who served a larger history than self profit.

Presently ARC is at last away on its chosen course of concentration on communications for all to whom highest dependability and saving of space and weight is important. Nor can it be doubted that in the coming decade, should peace be our national lot, the burgeoning traffic of the airways will be assured of expansion with safety and reliability in good measure by Aircraft Radio Corporation equipment in thousands of cockpits. END

OX-5 Escapades

(Continued from page 58)

and the two "Ticket hawks" Bill had brought went to work on the yokels. Bill went out with three passengers first to see how he could clear the fence, and that Wright 330 hp snaked them out in fine shape. Knowlin's kid jumped me for a ride while I was checking my radiator and, in order to stall, I sent him after water. Pete got a couple of young bucks in the Eaglerock and tossed them against their seat belts a few times. When they returned, the enthusiasm over that "Thrill ride" really put Pete in business. Our program called for the show to start at two o'clock, at which time the auction was to be over. The crowd thickened and our flying increased. All the people stayed in the pasture watching us and poor Mr. Knowlin couldn't get his auction under way. He came out and asked us to shut down flying until show time so he could sell something. We all said okay—that we would go to lunch. We left the ticket hawks with the airplanes.

When we returned from lunch we had a fair surface wind. I went lumbering down the field, cleared the fence by about a foot and settled right on top of some young corn. I thought sure I was going in but the OX-5 kept wheezing and we made it. I wiggled around over town and the crowd for a while and came in. Carmack said, "Penny, why don't you and Pete do a couple of stunt numbers because it's late and the crowd is a little anxious."

Pete put on a fine show and wound up doing a true "Hammer-head" landing. I rolled and looped and spun, accidentally. When I came in, I had toilet paper festooned from the airplane because the old buzzard wouldn't go fast enough to blow it off. Carmack was ready to do his jump. Bill and Pete had done well hopping passengers and the crowd seemed well pleased. Old "Mile-Hi" got into the front cockpit and we took off. About ten minutes later, we were circling the up-wind side of the pasture at 1,200 feet when a front hose connection on my radiator let loose. Cylinders began to cut out and Carmack began to crawl out. Standing on the wing-walk he shouted, "Penny I'm going to leave." With that he dropped off, popping his 'chute right under my tail group. I went sputtering downwind and had four cans working when I turned on base leg. On final, the old OX-5 gave up the ghost and I was under-shooting the pasture a little. I caught the top wire on my tail skid and plopped into the sod tearing out the tail skid. Sure was a short landing.

We tied the old Eagle to the fence and I decided to ride home with Bill and return on the morrow for my plane. Mr. Knowlin paid Carmack the rest of the guarantee and we all went home happy. Such was the first and last appearance of the "Rebel Air Devils." END

U. S. TEAM FOR 1957 INTERNATIONAL BALLOON RACE

As we went to press, the American team which will compete in the International Balloon Race at Hengelo, Holland, left New York International Airport aboard a KLM plane. The first such American team since before World War II, they are left to right: Anthony Fairbanks, Swarthmore, Pa., Mrs. Constance Wolf, Blue Bell, Pa., and Francis Shields, Green Ridge, Pa. The race is a handicap event for distance covered in four hours. Other teams competing are from Holland, Belgium, Denmark, Germany, Austria, France, Switzerland and Turkey. The Americans planned to use a 35,000 cubic ft. capacity balloon for the race and had also shipped to Europe the very beautiful balloon, "La Coquette," featured in the film "Around the World in 80 Days," and in which they had been invited to make several exhibition flights while abroad. For the story of the first International Balloon Race, see the book condensation, "Memories of a Pioneer," in this issue.

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MAILBOX

(Continued from page 6)

friendly hospitality. The vehicle which was placed at my disposal was sincerely appreciated. In particular, I would like to thank Mr. Frank Scahill for his attention to the servicing of my ship, and assistance in obtaining motel accommodations and weather information. Mr. Scahill is definitely an asset to their organization.

I strongly recommend Mt. Hawley Airport as a stopping point in the itinerary of anyone planning a flight in that direction. And, incidentally, the prime roast ribs of beef (at a price anyone can afford) at Hager's Stagecoach Inn adjacent to the field would satisfy the taste of a gourmet. Superb accommodations can be obtained at Motel 88 across the street but I would recommend advance reservations.

JOHN E. CORNWELL
North Syracuse, N. Y.

RENDEZVOUSED TOO SOON

I enjoyed reading "Rendezvous at the North Pole" very much. However, I think one of the dates mentioned is in error. You have the first B-47 landing at Thule AFB on "5, Feb. 1943" and I think you mean 5, Feb. 1953. Evidently it was a printing error.

JAMES P. WELLS
McGuire AFB, N. J.

• *You are quite correct—the year was 1953. We also thank Mr. Michael Albi, Portland Ore., for calling this to our attention.*—ED.

FLYING CLUBS

Each issue of FLYING is read avidly here and we particularly like the stories pertaining to flying clubs; their growth, problems and accomplishments.

In September 1955, a group of us tried to get off the ground but with little success. This period immediately following the end of occupation saw a great surge in aircraft purchases by the German people. This demand prevented us from obtaining an airplane for anything like a reasonable price. . . . We priced British-made Proctors, Miles Magisters, Tiger Moths, German Messerschmitt Taifuns and Bueckers, all to no avail. A reconditioned J-3 Piper with 0-0 hours SMOH sold for DM 12,500 or slightly more than $2,970 U. S. money! Prices more than lack of interest kept us on the ground.

Last July another group of Americans in and around Nuremberg were attempting to get a club organized, so we all joined forces. One of our members went back to the States on leave and found a J-3, obtained export license, had it crated and flown to Frankfurt, the Rhein Main Airport, where we picked it up . . . and now we have the Nuremberg Flying Club out at Nuremberg International Airport.

We have approximately 35 members and among these seven licensed pilots ranging from multi-engine commercial flight instructor to student. Fortunately we have an instructor who has taken care of our problems of getting more pilots within our ranks. Our senior officer at present (Feb. 1957) is Lt. Col. V. B. Marquis, Commanding Officer of the European Exchange Depot at Ansbach who doubles as our V.P. Our president, the person who went to the States and found the airplane, is James L. McDaniel, manager of the Furth EES shopping center. Both rendered invaluable assistance in our formation stage, the president in taking leave at an opportune time and the vice president in helping us financially until all dues were in.

It is a great thing operating out of a large airport insofar as we meet many of the local persons with similar interests. German-American relationships could not be better. . . .

M/SGT. HENRY D. PRUDEN
APO 66,
6th US ASA Field Station

A new Tri-Pacer is the proud possession of members of the Aero Club of the USAF's Chateauroux Air Station, Deols, France, which is made up of civilians and personnel of the base. Financed through profits from the base PX, theaters and bowling alleys, the plans, believed to be the first ever purchased through a Base Welfare Fund, was delivered at the Piper plant to Maj. Ray Clark (left) and Lt. Charles Swain, USAF on behalf of the club. Plans are already under way for the purchase of a second Piper plane for the club which has 100 members signed up for flight and ground school.

BILL STROHMEIER
New York

After reading Charles E. Morraler's letter about the Jersey Aero Club, one becomes envious.

I personally feel that a flying club is the answer to a person's problem who wishes to fly at reasonable cost. The JAC has done an outstanding job in keeping the cost down and the pleasure up for its members.

If anyone should know of a similar club in my area I would appreciate it if they would drop me a card.

JOHN A. BARLOW
25 W. Olive St.,
Westville, N. J.

Personal Paradise for Pilots

(Continued from page 29)

snakes or ticks to detract from outdoor living and playing. Two abandoned gold mines, homesteaders' cabins, campsites of Indians who made yearly hunting trips to the island, and an old log school house whose teacher was hanged for murder, remain as evidence of the rich historical lore of Blakely. The island was charted and named by the Wilkes Expedition in 1841.

The Blakely Island Club, including a commissary for groceries and sporting goods, boats, and motors, is available to all estate owners. As a central meeting place, the 104-foot clubhouse provides social life with its large fireplace and bar facilities. At night, rare moments of comedy are for those who wait patiently for the raccoons which may be lured into a cabin with scraps of food. Alternately wincing-shy and snarling-bold, they are nature's top comedians.

For those of us who like to go visiting by air, we are only a few minutes flying time from nationally recognized places of scenic interest such as Hoods Canal, The Olympic Peninsula, Victoria and Vancouver, B. C., Mt. Baker, Mt. Rainier, Bellingham, Olympia, Seattle and many other points. Two-way contact with the mainland is maintained at Blakely by means of "ship-to-shore" radio-telephone. Aviation weather from Bellingham and Seattle is always available on the low frequency radio in the clubhouse lounge. Aviation gas is, of course, available at the flight strip.

Blakely is not meant to be a tourist resort in the usual sense. No attempt is made to attract overnight transients. Visitors who wish to investigate the island's facilities and possibilities are heartily welcome at any time, and Floyd personally conducts them on a jeep tour of his island. Floyd and Mrs. Johnson maintain permanent residence from April to December. For anyone planning to visit Blakely, a card to Floyd at Orcas, Wash., will prepare the way for hospitality of highest order and unquestionably, they will confirm that it is a pilot's paradise. END

Check Pilot Report on the Trecker Royal Gull

(Continued from page 40)

filler connections. This tank is now easily accessible from the left wheel well. Engine cowlings peel like an orange to save time in inspections and maintenance. Improved insulation and relocation of exhaust stacks is a gain, as is an enlarged fin and rudder area, plus an increase of rudder throw to aid in single engine operation. The Trecker Aircraft Corporation has even improved the original hull design for better water take-offs. The hull contains six water-tight compartments.

While I did not have opportunity for altitude tests, many such have been made around Colorado, Wyoming and Mexico City. In every respect that came under my observation, the plane met its specs readily and undoubtedly does likewise at altitude. END

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ANYTHING SOUND FAMILIAR?

REMEMBER a certain day back when you were a student pilot? That first time you flew cross-country instead of making just take-offs and landings? Woodford Rhoades of Upper Montclair, N. J. thought readers of FLYING might get a kick out of these snapshots on his first "familiarization with other airports" flight from Totowa-Wayne, N. J. to Zahn's, Amityville, L. I., in a Tri-Pacer with instructor Warren L'Heureux; and next day to Morristown, N. J. in an Aeronca.

1. "Relax! And quit fiddling with the trim tab. The plane is flying okay."

5. "Hey! How's about keeping your heading? Bear left—use some rudder!"

2. "Say, Chief—where the heck is Zahn's Airport? This one is Republic's."

6. "So *that's* how the green light looks. This Morristown Airport sure has a wide runway. Guess I'm landing okay."

3. "Well—what do you know—Zahn's is right where the map says it is! That snow cloud at Coney Island . . ."

7. "Sort of a narrow strip back here at Totowa-Wayne, but I think I'm lined up all right. Now, about that wind . . ."

4. ". . . it sure put us off course. Made us take 40 minutes for our estimated 22 minute flight. Sign my log book, will you?"

8. ". . . well, I made a fairly smooth landing, didn't I? Think I'll stop now while I'm still ahead. Here's my log."

I Learned About Flying from That!

(Continued from page 60)

seen neither river before, and my map showing little detail of the terrain between them, I assumed that the mountains ahead separated the two. As we crossed the river, and it *did* look much too big for what I'd heard of the Willamette, I had a feeling that we were much too far to the east side of the valley. I scanned the west carefully, but could see nothing resembling a city or town, so crossed the "Willamette" climbing to clear the mountains.

Some 20 minutes later, we were still climbing toward the peak of an enormous snow covered mountain—we were now past our ETA for Portland—my river had disappeared into a gorge behind us. Looking west at the gathering dusk—up at the two gas gauges, both getting dangerously near bottom—and down at the desolate slope beneath—I lifted the phones off my wife's head and put them on my own. There was not a sound—even when I turned the volume up full. I looked at my wife, who suddenly realized what was happening! She was *still* hearing the loud "on course" *without* the phones, and knew, as I did, that we were in big trouble!

The nightmare of the next 50 minutes remains etched sharply in both our minds! The long, flat glide down the slope of Mt. Rainier (for that is where we turned back) desperately trying to reach the river and a chance of survival. The awful forsakenness of the windswept snow and ice beneath us—our dying receiver, which gave back only garbled and meaningless words in response to our frantic pleas for help—the surge of hope when a cluster of lights appeared in the distance—and our prayers that the whisper of gas left in the tanks would get us at *least* to the lights.

We did make it to the lights, circled a huge excavation and debated crash landing, but decided to try the river for a sand bar or beach. Search for a landing spot along the river brought nothing and it was growing blacker by the minute! We were down to river bank level, using just enough power to maintain flight, the engine operating on what must have been the fumes in the tanks! Just as I decided to ditch blindly in the river, what appeared to be a pasture between river and road showed up on my right. I lined up with the clearing and, using a road light as a guide, slid in over low trees in a wild nose high slip. We hit hard—bounced—came down again. The tail came high, dropped back to earth! We were down—unhurt—too emotionally exhausted to speak or move!

We'd blundered into the only spot for miles in which we could possibly have gotten down. Cascade Locks is a small resort community four miles east of Bonneville Dam in the Columbia Gorge. Our "Airport" was 900 feet by 300 feet, rough and full of stumps and bushes. Examination of the field next day confirmed my suspicion that I'd have chosen the river in daylight.

A very much wiser pilot has never since been guilty of over-confidence. END

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(Continued from page 55)

into rain. The rain falls through the colder air below increasing its moisture content so that it also becomes saturated. As the warm air progresses up the slope, with constantly falling temperature, altostratus and cirrostratus clouds appear. Finally in the freezing stratosphere the condensation appears as thin wisps of cirrus clouds. The upslope is very gradual, rising approximately 1,000 feet every 20 miles. In view of this, cirrus clouds at 25,000 feet altitude would tend to indicate that the warm front is about 500 miles away.

Cold front—Acting similar to a snow plow, the cold front slides under the warmer air and tosses it aloft. This causes sudden cooling of the warm air, resulting in the formation of nimbostratus if the front is moving slowly, and cumulonimbus if moving rapidly. Along with this cloud formation is severe precipitation with gusty and turbulent winds. The slope of a cold front is much steeper than that of a warm front and the progress is usually more rapid, somewhere between 20 to 25 mph. Such action creates sudden storms, high winds, turbulence; and makes a complete change in weather within the space of a few hours.

After a front has passed, the weather clears rapidly with cooler, drier air, usually unlimited ceilings and visibility, a wind shift, and a rise in barometric pressure.

After installing my Windometer, the first such situation I encountered was that of a cold front. I anticipated a late-afternoon flight to Dayton, Ohio, 165 miles to the southwest, and checking the newspaper weather map at breakfast, found that a cold front existed in that area. The front indicated movement to the northeast.

An hour later I listened to the radio sequences and read the Windometer. The data was plotted and the situation appeared as shown in Fig. 1. The front was over Dayton with severe thunderstorms and Mansfield, Ohio, began to show "symptoms." Northfield was beginning to have scattered cumulus, but conditions were generally good.

After lunch I checked again and found that Dayton reported clear. The pressure had risen to 29.79, the wind was NW 18 (a wind shift), the temperature dropped 26 degrees to 48 F. as the cooler air mass took over. This indicated that the front had passed and conditions were not "false" ones, which sometime develop for a short time in and near a front. Meantime Mansfield weather was deteriorating. Pressure dropped to 29.73, temperature to 75 F., wind direction still from SSW, but velocity increased to 20, and scattered cumulus appeared at about 1,000 feet with towering cumulus to the southwest.

Northfield now began to develop signs. The Windometer unit reported a drop in pressure to 29.80 and an increase in wind velocity to 15, along with no change in wind direction. Temperature increased three degrees to 78 F. and scattered cumulus at 1,200 feet began to grow in size. It became evident that the front

WHERE AM I?

As hard to miss on a clear day as a wide open hangar door at 200 feet, this airport lies nine miles southwest of the center of a city which is notably divided by two branches of one river. In the early days this river, a shallow prairie stream, was of great value as a portage from one body of water to another for explorers, fur traders and missionaries who traveled the open country long before the city's founding.

(Answer on page 95)

would pass through Northfield and that I had better hold up my departure until after it passed. By doing so, I would enjoy pleasant flying conditions all the way to Dayton.

The question now was, how soon would the front move through and what time would I be able to take off? Well, as soon as Mansfield reported the wind shift, drop in temperature and rise in pressure after the period of severe thunderstorms, I had an estimate of the time it took the front to move from Dayton to Mansfield. It was then an easy matter to compute how long it would take the front to travel the 65 miles between Mansfield and Northfield. According to my figures it would arrive at Northfield at 16:35 hours. I planned my take-off for 17:30. As the ETA of the front drew near, the Windometer supported my forecast and at 16:15 the thunderstorms rolled in and pelted the area with heavy rain and hail. It passed through in approximately an hour and I was off the ground in my PA-12 at 17:30, headed for Dayton.

In another case, I was confronted with a warm front situation. A warm front had developed near Fort Wayne, Ind., and was moving east. Fort Wayne is approximately 200 miles west of Northfield. When I collected my data from the morning radio sequences and the Windometer, the situation appeared as shown by Fig. 2. In that I had a business appointment at Zanesville, Ohio, that afternoon, I became interested in the rate of frontal movement to see if I could make the 100-mile trip and return before conditions dropped below VFR.

When I checked the weather picture at noon, there was no appreciable change. During the lapse time of four hours the front had not completely passed through Fort Wayne. Findlay's readings varied only a fraction in temperature, pressure, wind direction and velocity, and sky cover. Likewise at Northfield the Windometer indicated no great change. On this indication of slow frontal movement, I took off for Zanesville where conditions were reported similar to those at Northfield. While enroute on both legs of the trip, I kept a close watch on reports and did see a gradual movement of the front as reflected by sequence reports. However, conditions did not drop below VFR until hours after I had completed the trip and tucked the plane in its T-hangar.

On many other occasions, when unable to consult with an official weather station, my "private weather station" has aided me considerably in planning safe VFR flights. In addition, the Windometer unit alerts me to hazardous take-offs in gusty weather by accurately reporting the peaks and true direction of the wind. It also posts me on approximately how soon the turf strip at the field will dry out after a heavy rain, by indicating the amount of wind passing over the area. Having that information aids me in forecasting how soon morning fog will dissipate and allow a no-sweat take-off. END

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The Lady Finally Hacked It!

(Continued from page 37)

Childress and got my log book signed.

My next landing was to be at Tradewind Airport, on the southern edge of Amarillo. Neither Childress nor Tradewind have towers, so I tuned to Amarillo and asked for wind. I again got my log book signed and had the plane "topped-off," just in case I took the "long way home."

When J. T. and I started flying we wished Lubbock had a small field where we could practice. Now we are glad we had to take instruction where we could learn radio. Students seem to have an aversion to radio. I did at first, mostly because of the standardized phraseology. It is easy to get rattled while trying to communicate and concentrate on flying, when both are such new experiences.

One student was ready to take off but told the tower he was "ready to land." The tower asked, "Just where are you? I don't have you in sight." He had to confess he was sitting on the end of the runway. Another reported he was on final approach and asked permission to taxi!

Not long after I soloed the 170 whose identification numbers were 09B, I started flying a 172, whose numbers were 38A

but I kept saying, ZERO NINE BRAVO in my communications with the tower. After three landings, the tower asked, "ZERO NINE BRAVO, aren't you THREE EIGHT ALFA?" I had to admit that I was.

Then there was the day I lined up behind two Convairs and told the tower I was "third to land." I got a surprised "Huh?" from the tower. I followed the big planes in fairly close and just as I touched down my plane seemed to go wild. It flopped around and skidded off the runway. I didn't have time to think but jabbed carburetor heat off and shoved the throttle full on, headed cross-wind with the stall warning "beeping" like mad. A plane on the taxi-strip was waiting to take off and a woman had her face pressed against the windshield with her mouth wide open—she looked so funny—I laughed out loud. I didn't know what had caused me to lose control of the plane. I thought, if I ever get on the ground I'll stay there. It took all the nerve I could muster to come in for another landing. For several days I hedged around thinking up excuses not to fly. Finally I had to tell what had happened to me and learned why it happened. It was my first experience with prop wash and I don't crowd in close behind the big fellows anymore.

It takes a long time for a busy housewife to log 25 solo hours. J. T. got away ahead of me. He made several business trips to Missouri and attended fly-in breakfasts. By the time he had his required solo time, he had 27 dual cross-country hours. When he got his Pilot Certificate he came home with his chest out so far he could hardly see over it. He has a right to be proud. He had to pass a medical flight check as well as the regular flight check. J. T. is totally blind in one eye.

By this time we had our own Cessna 172. I went to the factory at Wichita, on dual cross-country and flew it back. My own! A thrill I don't expect to experience again in a lifetime.

When I finally got my hours in, I found myself stalling, just as before I soloed. I knew I was ready. Bob thought I was. But on the day I took my flight check, I crawfished in every way I knew how. I said, "Good, I'm tired this morning—didn't think I'd ever get the children off to school; didn't have time to eat breakfast, and I still have my house shoes on." But to no avail. I was tense all during the check. I doubt if my flying was up to par, but when it was over, Emmet Morris, the CAA Examiner, wrote out my airman certificate. As the boys at the airport say, I had finally hacked it!

I wasn't as thrilled or excited as when I soloed, but I did have a wonderful sense of accomplishment. I remember my grandmother when she was 106, and my great-grandmother reportedly lived to be 110. If I can edge that up just a little, I'll be one of the "old timers" about to tell my great grandchildren about having owned the first Cessna 172 in Lubbock, Tex. END

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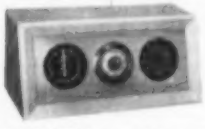

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Hushing the Jet

(Continued from page 30)

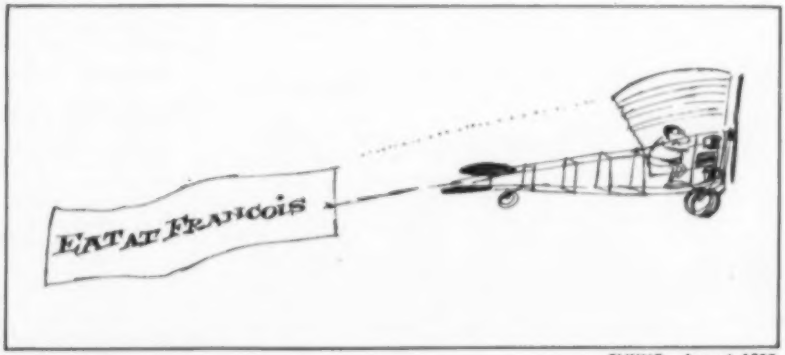
like a giant hand tearing an acre of heavy wrapping paper. One way of suppressing it is to enlarge the diameter of the tail pipe but this increase of the tail pipe dimension, causes loss of power as well as additional drag. Curtiss-Wright solved the problem with the segmented suppressor, obtaining through it greater exhaust orifice area while holding tail pipe diameter to its most efficient size. In addition, the exhaust temperature of the TJ-38 is 360° F. lower than that of comparable jets. This reduces exhaust velocity and helps further to hush the noise. The lower heat range adds to engine reliability and prolongs its service life, an important factor in the economy of airline operation. Dry weight of the TJ-38 is 3,600 pounds, or 17 per cent less than military turbojets of equal rating. The saving in weight means higher payloads, longer range and better performance for the jet transport. Like most modern automobile engines the TJ-38 derives its power and fuel economy from high compression. The twin-spool compressor, consisting of low and high pressure axial flow blowers mounted on concentric shafts, supplies air at 10.5:1 ratio to the combustion chamber.

Because of its constant power feature the engine is independent of temperatures which affect standard jets, and does not have to rely on water injection to maintain maximum thrust while taking off under unfavorable conditions. Pure water, from which silicons and other minerals, harmful to turbine blades, have been removed, is more expensive than fuel. All these factors speak favorably for the TJ-38 as a powerplant for the forthcoming jet-liners. Its light weight, low specific fuel consumption and constant power will benefit the airlines financially. The resultant good climb-out will curtail the duration of noise which, together with the engine's low sound level should make it acceptable to airlines operating in congested areas.

Another significant development by Curtiss-Wright is the jet thrust reversal which enables the high speed jet airliners to operate from standard runways by reducing the critical landing roll by as much as 50 per cent. Jet thrust reversal is not new in principle, work on it has been going for years when it was realized that some sort of braking device, comparable to the propeller reversal of piston engine transports, was essential in order to bring the aircraft to a stop within the length of modest size runway. It is especially important under icy runway conditions when wheel brakes are of no avail. Many problems had to be licked before the method became practical, among them were, simplicity, reliability and the proper direction of exhaust gases, which had a tendency to flow along the fuselage or nacelle creating heat problems and engine stoppage through "ingestion." The hot gases flowing forward were sucked in (ingested) by the engine air intake causing flame-out. Curtiss-Wright claims to have solved all these problems. Their device, resembling a pair of side-mounted trap doors, is located on the airframe of the aircraft; nacelle pod or rear fuselage section surrounding the tail pipe. It conforms with the shape of the structure and when not in use does not cause drag. The two panels are hinged at the rear and, when opened, face forward. The exhaust hitting the rear of the deflector is forced to reverse its course. According to Curtiss-Wright, 60 per cent reverse thrust is obtained by changing the direction of gases 180 degrees. Incorporated in the design is a "fail-safe" feature which prevents the deflectors to open inadvertently. It utilizes principles of aerodynamics and the pressure of ejected gases to hold it in place or return it to forward thrust position without recourse to mechanical means.

Angle of opening can be varied depending on requirements. For example, thrust can be reduced without decreasing engine rpm's. This is especially advantageous in the event of wave-off during carrier landings or missed approaches as immediate power is available by closing the deflectors. Usually it takes a jet about ten to 12 seconds to accelerate from below cruising rpm to full power. Partially opened, the deflectors act as dive brakes considerably steepening the glide angle on final approach.

The thrust reverser is manufactured by the Propeller Division of Curtiss-Wright Corporation. It will be available for the TJ-38 commercial turbo-jet as well as for any other jet engine. Its benefits to both military and commercial applications are obvious. In combination with the TJ-38 it will complement the already low sound features of the powerplant by permitting higher approach to a landing over populated areas. END



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FLYING CALENDAR

July 28—Strawberry Festival Fly-in, Lebanon, Ore., sponsored by Sportsmen Pilots of Oregon.

July 28—Third Annual Jaycee Air Fair, Portland International Airport, Portland, Ore., sponsored by Portland Jr. Ch. of Comm.

July 30-Aug. 2—Nat'l Flying Club Assoc. Inc., Annual Convention, Denver, Colo. Contact: B. V. Deltour, 948 E. 120th St., Hawthorne, Calif.

July 31-Aug. 4—Air Force Assn. eleventh annual convention, Washington, D. C.

Aug. 3, 4—Emerald Empire Rodeo Buckaroo Fly-in Breakfast at Eugene, Ore. featuring the northwest's largest rodeo.

Aug. 3—Brown County (Ohio) Air Tour.

Aug. 4—Annual Trout Breakfast, Mission Field, Livingston, Mont., sponsored by Montana Pilots Ass'n. Write Jim McGuire, P. O. Box 662, Livingston, Mont.

Aug. 10—Hardin County Air Tour, Kenton Airport, Ohio.

Aug. 10—Auglaize County Air Tour—Orval Ritchie and Joe Fisher Farms, 3 miles north of Wapakoneta, Ohio.

Aug. 10, 11—Professional Race Pilots Ass'n Meet. Closed course midget plane races, Oshkosh, Wis.

Aug. 11—Wallowa Mountain Rescue Teams Fly-in Breakfast at Joseph, Ore.

Aug. 17—Crawford Air Tour, Bucyrus, Ohio.

Aug. 18—Free Fish Fry Fly-in at Pacific City, Ore. sponsored by Sportsmen Pilots of Oregon.

Aug. 25—Fourth Annual Fly-in Breakfast, Peotone Airport, Peotone, Ill., cosponsored by the Park Forest Flying Club and the Park Forest CAP Sq. "All you can eat" breakfast for $1. Prizes for pilots and planes.

Aug. 30-Sept. 1—Kentucky Jaycee Air Tour. Write: John Landrum, Ky. Aviation Ch., Harrodsburg Jaycees, Harrodsburg, Ky.

Aug. 30, Sept. 1—Fifth Annual Fly-in and Convention of Experimental Aircraft Assn. Curtiss Wright Airport, Milwaukee, Wis. Contact: P. H. Poberezny, 9711 W. Forest Park Dr., Hales Corners, Wis.

Aug. 31—Fourth Annual Jim Long Trophy Race from Brackett Field, LaVerne, Calif. to Phoenix, Ariz. and ret. sponsored by Pomona Valley Pilots Assn. % Brackett Field, P. O. Box 73, LaVerne, Calif.

Aug. 31-Sept. 1—Professional Race Pilots Ass'n closed course midget plane races, Fort Wayne, Ind.

Sept. 1—Salem, Ore. Annual Air Fair sponsored by Sportsmen Pilots of Oregon.

Sept. 1—Jaycee Air Fair, Lebanon, Mo. Rain date: Sept. 1. New 3,000-foot paved runway. Write John T. Russell, P. O. Box 232, Lebanon, Mo.

Sept. 7—Lake County Air Tour, Concord Airport, Painesville, Ohio.

Sept. 7-8—First Maine Air Fair, Auburn Lewiston Municipal Airport, Auburn, sponsored jointly by Auburn Exch. Club and Maine Aero Club, Lewiston-Auburn branch. Cocktails, banquet and dance Saturday night at nearby Poland Springs where Ninety-Nines also convene. Fly-in breakfast Sunday at Sky Harbor Flying Service Hangar at Airport. Float plane facilities at Poland Spring, special hotel rates, and transportation. Air show includes new plane and equipment display; all military services; glider flights; private plane competitions; model aircraft; CAP and crop dusting demonstrations. Contact: Maine Air Fair, Box #81, Auburn, Maine.

Sept. 8—Greater Cincinnati Airmen's Eighth Annual Trophy Race, rain date: Sept. 15. Contact: Margaret L. Berning, Publicity Dir., Airmen's Club, 2d fl., adm. bldg., Lunken Airport, Cincinnati 26, Ohio.

Sept. 14—Second annual National Convention of the OX5 Club, Tulsa, Okla. Selection of Mr. OX5 for 1957—Awards dinner. Convention Headquarters, Box 1228, Harrisburg, Pa.

Sept. 14, 15—International Antique Aircraft Show, Ottumwa Airport, Ottumwa, Iowa, sponsored by Iowa Antique Airplane Assoc. Col. Joe Mackey Trophy.

Sept. 15—Middletown Aviation Club Treasure Hunt, Middletown (Ohio) Airport. Rain Date, Sept. 22.

Sept. 17, 21—World Plowing contest, north of Peebles, Ohio.

Oct. 8—Iowa State Mechanical corn picking contest to be held on the Municipal Airport grounds, Washington, Iowa, starting at 0900.

Oct. 20-22—Fourth annual Western Forum of American Helicopter Society, Statler Hotel, St. Louis, Mo. Write: Forum Ch., Marvin D. Parks, McDonnell Aircraft Corp., Lambert-St. Louis Mun. Airport, P. O. Box 516, St. Louis 3, Mo.

Calendar items must be received at FLYING's editorial offices, 366 Madison Ave., New York 77, N. Y., three months prior to the event.

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CORRECTED CREDIT

In the November 1956 issue of FLYING we erroneously credited the picture used for "The Airman's World" to USAF. We have since learned that photograph was taken by Robert Symons of Bishop, Calif.

ANSWER TO "WHERE AM I?"

(See page 88)

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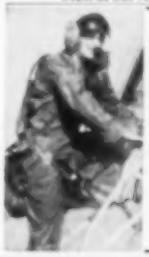

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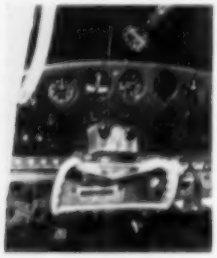
New York and Los Angeles via Chicago, and Victor 1518 between Washington and Los Angeles, via Nashville, Tulsa, Oklahoma City and Albuquerque, are completely equipped for immediate use. The remaining ten will be put into operation as soon as the equipment is available.

GLOBE INDUSTRIES, Dayton, O., advises that its magnetic heading autopilot is available for Cessna and Piper aircraft. Designated the Globe Mark II, the new autopilot is CAA approved for installation on the Cessna 170, 172, 180 and 182, and Piper Tri-Pacers. The Mark II command console mounts on the control wheel of light aircraft or, at the owner's discretion, on ceiling or panel. The system is built around the Globe Gyro-Stabilizer which has been on the market for three years.



SIMULTANEOUS with the announcement of publication of a European edition of the Jeppesen Airway Manual, Jeppesen has announced the opening, June 1, of offices and plant in Frankfurt, Germany. Following the establishment of the European plant, the company plans to further extend its service into the western Pacific area as far as Australia; also into the Mexican, Central and South American areas.

RECENT LEGISLATION in Indiana grants the State Aeronautics Commission full control over the heights, location and visual identification characteristics of structures within a distance of two miles from boundary of any public use airport.

UNDERGOING EVALUATION for supersonic aircraft is this Convair developed "Aerial Bobsled" ejection seat. Top photo shows how pilot sits in normal flight attitude in mock-up of the contoured seat. Lower photo shows seat rotated 90 degrees into supine position for launching into airstream. With pilot's legs securely positioned against his chest by foot supports and contoured seat pan, seat is automatically ejected by a small rocket motor.

WHEELER AIR LINES, Canadian non-scheduled carrier and Butler Aviation, fixed base operator at New York, Chicago and Washington, are the latest to order Fairchild prop-jet transports. With 62 firm orders from U.S. local carriers and corporations and 14 on order from non-U.S. airlines, production plans call for completion of the first two aircraft by the end of this year.

AMERICAN AIRLINES and United are offering their baseball fan passengers the service of reservations for the games at their ticket offices, at the same cost as when purchased at the ball park. Additional information can be obtained at airline ticket offices or authorized agents.

CAREER OPPORTUNITIES in aviation are presented in booklets recently published by the Aircraft Industries Association and the Air Transport Association. Free, upon request, is the AIA booklet "Career Opportunities in the Aircraft Industry" and ATA's booklet, "Career Opportunities with the Airlines." Address AIA; 610 Shoreham Bldg., Washington, D.C. and ATA, the Wyatt Bldg., 14th and New York Ave., N.W., Washington, D.C.

BENDIX AVIATION reports a new 26-lb. airborne weather radar transmitter receiver, with a range of 150 miles. The new unit is called the RDR-1D.

NEW ANGELS WINGS for members of the Navy's famed six-man precision flying team, the "Blue Angels," come in the form of Grumman F11F-1 Tiger jet fighters. The Tigers are successors to the Grumman Cougars in which the "Blue Angels" have been entertaining the public since 1955.

FOR HIS OUTSTANDING FLIGHT in the rocket-powered Bell X-2 research aircraft to an altitude higher than ever reached before by man, Captain Iven C. Kinchelow, Jr., Korean Jet Ace, currently experimental test officer at Edwards AFB, Calif. is recipient of the Mackay Trophy for 1956. The Trophy is awarded annually to the Air Force person or organization accomplishing the most meritorious flight during the previous year.

JACK ADAMS AIRCRAFT SALES, INC., of Memphis, Tenn. is a new Beechcraft distributor. Located at Twinkle Town Airport ten miles southwest of Memphis, the new firm will handle Super 18's, Twin-Bonanzas and the single engined Bonanza in a 69-county area, in parts of Tennessee, Mississippi and Arkansas.

SHOWING AN INCREASE of 29 per cent over 1955, the Federal Airways System handled 817,000 instrument approaches in 1956. General aviation, while representing only nine per cent of the total, showed the greatest increase over the previous year—51 per cent.

HIGHLIGHT OF RECENT New Mexico Cattle Growers Convention at Albuquerque, N. M., was this Cessna 172 shown being lifted to its perch on the balcony of the Hilton Hotel. Staged by Southwestern Skyways of Santa Fe, the

plane created tremendous interest for the cattlemen, many of whom employ aircraft in their own operations. Per capita use of aircraft is higher in the Rocky Mountain and Plain State area, it is said, than in any other part of the country.

THE CORPORATE NAME of The Glenn L. Martin Company is, henceforth, simply The Martin Company. The change of name, according to company officials, in no way alters the identity or character of the Corporation and its personnel, nor relationship to its suppliers.

MEMBERSHIP in the Flying Physicians Association has increased to 385 dues-paying members, or about one-half of the 792 known physician-pilots in the U.S. and Canada. Believing there are many more flying doctors than listed, the FPA invites those who may be interested in joining to communicate with the Association's headquarters, 25 Jackson St., Little Falls, N.Y.

IGOR I. SIKORSKY, internationally known aircraft and helicopter designer, retired on May 25, at the age of 68 years, after many years as engineering manager of the Sikorsky Aircraft Division of United Aircraft. Mr. Sikorsky will remain with United as a consultant.

SHOULD NORMAL cabin pressurization fail in any of the new jet liners scheduled for operation in a year or so, emergency oxygen masks will be automatically dropped in front of each passenger. This system developed by Scott Aviation is activated by an automatic control in which an aneroid senses the change in cabin pressure and triggers the system. An extra mask is provided at each pair of seats for children.

OFFICERS OF THE NATIONAL FLYING CLUBS Association are attempting to contact all flying clubs in the country to offer their assistance and invite participation on a national level. Those interested are asked to write B. V. Deltour, 948 E. 120 St., Hawthorne, Calif.

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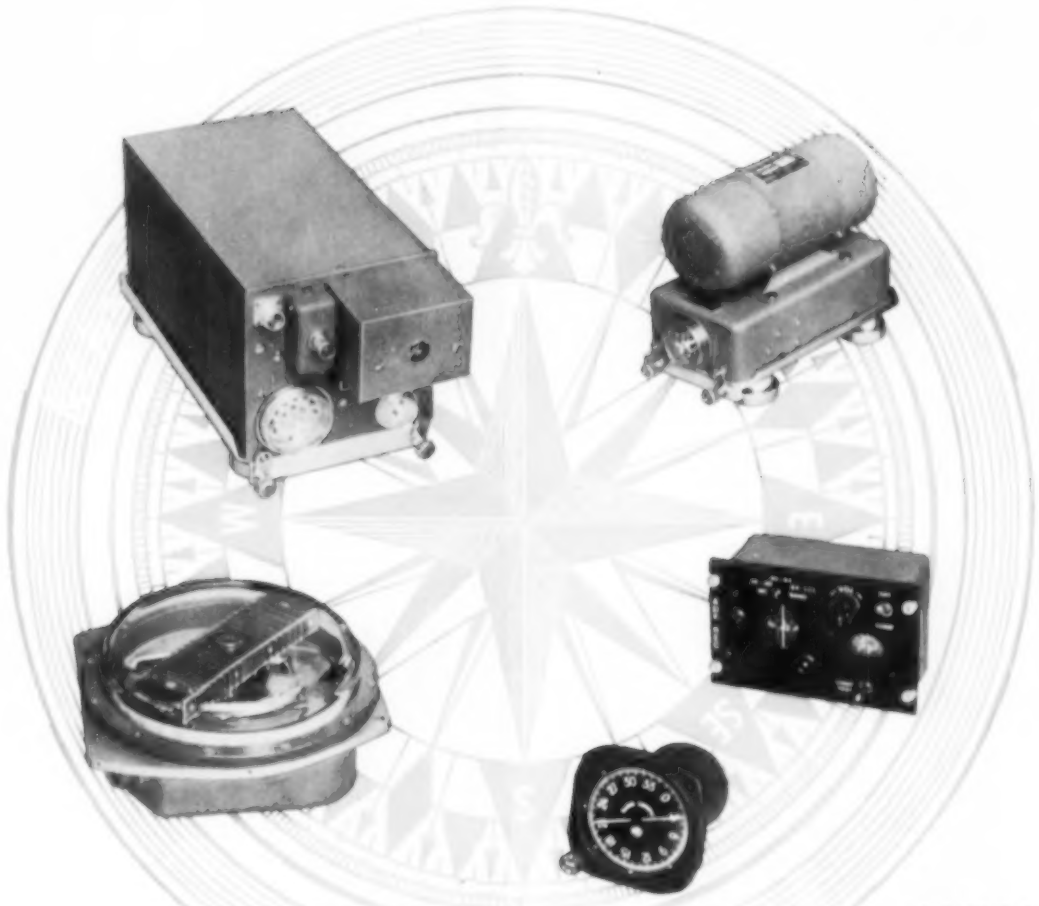

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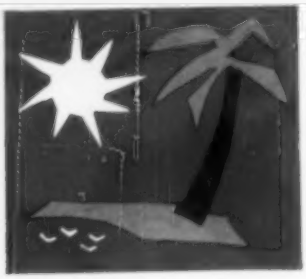

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